F-839

IONOSPHERIC DATA IN JAPAN

FOR NOVEMBER 2018

VOL. 70 NO. 1 1

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≪Real Time Ionograms on the Web ・・・・・・・・・・・・http://wdc.nict.go.jp/index_eng.html≫

NATIONAL INSTITUTE OF INFORMATION
AND COMMUNICATIONS TECHNOLOGY
TOKYO, JAPAN

INTRODUCTION

This Series contains data on ionosphere (I) and solar radio emission (S) obtained at the following stations under the National Institute of Information and Communications Technology , Japan.

Stations	Geographic(WGS84)		Geomagnetic (IGRF-10(2005))		Technical Method
	Latitude	Longitude	Latitude	Longitude	
✳Wakkanai/Sarobetsu	45˚10'N	141˚45'E	36.4˚N	208.9˚	Vertical Sounding (I)
Kokubunji	35˚43'N	139˚29'E	26.8˚N	208.2˚	Vertical Sounding (I)
Yamagawa	31˚12'N	130˚37'E	21.7˚N	200.5˚	Vertical Sounding (I)
Okinawa	26˚41'N	128˚09'E	17.0˚N	198.6˚	Vertical Sounding (I)
Hiraiso	36˚22'N	140˚37'E	27.6˚N	209.1˚	Solar Radio Emission (S)

✳We moved the observation facilities at Wakkanai to Sarobetsu on February 2009. The new observatory is located at approximately 26km south from the old observatory. The observation at Sarobetsu commenced on March 6, 2009.

IONOSPHERE

Ionospheric observations are carried out at the above four stations in Japan by means of vertical sounding using ionosondes. The ionosonde produces ionograms, which are recorded digitally on a computer storage medium. The digitally-recorded ionograms are collected from each station by the central computer and reduced to numerical values and Summary Plots by the automatic processing system. The ionograms obtained at Kokubunji are manually scaled by experienced specialists to supplement automatically-scaled parameters.

A1. Automatic Scaling

Digital ionograms are automatically scaled by the pattern recognition method. The following five characteristics of the ionospheric are listed below. The reliability of these factors has been ascertained by comparison of the automatically-scaled parameters with the manually-scaled values of large amounts of test ionograms.

The published data consist of tabulations of hourly values of three factors (*foF2, fEs*, *fmin*) and monthly medians of two factors (*h'Es* ,*h'F*), daily Summary Plots and monthly medians plot of *foF2*.

a. Characteristics of Ionosphere

foF2	Ordinary wave critical frequency for the ***F2*** layer
fEs	Highest frequency of the ***Es*** layer whether it may be ordinary or extraordinary
fmin	Lowest frequency which shows vertical iono-spheric reflections
h'Es ***h'F***	Minimum virtual height on the ordinary wave for the ***Es*** and ***F*** layers, respectively

b. Descriptive Letters

The following descriptive letters are used in the tables.

A Impossible measurement because of the presence of a lower thin layer, for example *Es* (for *foF2*).

C Impossible measurement because of any failure in observation.

G Impossible automatic scaling because of very small ionization density of the layer (for *fEs*).

N Impossible automatic scaling because of complex echoes.

Blank No digital record because of problems occurring in the auto matic data processing system, but existence of film record.

c. Definitions of CNT, MED, UQ ,and LQ

Median count (**CNT**) is the number of numerical values from which the median has been computed. In addition to numerical values, the count may include a descriptive letter G.

Median (**MED**) is defined as the middle value when the numerical values are arranged in order of magnitude, or the average of the two middle values if there is an even number of values.

Upper quartile (**UQ**) is the median value of the upper half of the values when they are ranked according to magnitude; the ***lower quartile*** (**LQ**) is the median value of the lower half.

If CNT is less than 10, there are blank spaces left.

d. Reliability of Automatic Scaling

The results of the comparison between automatically-scaled values and manually-scaled ones showed that hourly values of *foF2 , fEs* and *fmin* were scaled within a difference of 1 MHz from about 90, 90 and 99%, respectively of the test ionograms.

e. Summary Plot

Daily Summary Plots which are made from quarter-hourly digital ionograms are published to present general ionosphere conditions. The upper and middle parts of a Summary Plot show the diurnal variation of the frequency range of the echoes reflected from the *F* and *E* regions, respectively. The two solid arcing lines indicate the predicted values of *fxE* and *foE* calculated by the method described in the CCIR report 340. The lower part shows the diurnal variation of the virtual height where the echo traces become horizontal.

A2. Manual Scaling

The published data consist of tabulations of hourly values of the ionospheric characteristics and figures of daily *f*-plot.

All symbols and terminology in the tables or figures of ionospheric data are used in accordance with the "URSI Hand-book of Ionogram Interpretation and Reduction (Second Edition) 1972 " and its revision of chapters I-4, published in July 1978.

a. Characteristics of Ionosphere

fxI	Top frequency of spread ***F*** trace
foF2 ***foF1*** ***foE*** ***foEs***	Ordinary wave critical frequency for the ***F2***, ***F1***, ***E,*** and ***Es*** (including particle type ***E)*** layers, respectively
fbEs	Blanketing frequency of the ***Es*** layer, e.g. the lowest ordinary wave frequency visible through ***Es***
fmin	Lowest frequency that shows vertical ionospheric reflections
M(3000)F2 ***M(3000)F1***	Maximum usable frequency factor for a path of 3000 km for transmission by the ***F2*** and ***F1*** layers, respectively
h'F2 ***h'F*** ***h'E*** ***h'Es***	Minimum virtual height on the ordinary wave for the ***F2,*** whole ***F, E*** and ***Es*** layers, respectively
Types of ***Es***	See below b. (iii)

b. Symbols

(i) Descriptive Letters

The following letters are entered after, or used to replaced a numerical value on the monthly tabulation sheets, if necessary.

A Measurement influenced by, or impossible because of, the presence of a lower thin layer, for example *Es*.

B Measurement influenced by, or impossible because of, absorption in the vicinity of *fmin*.

C Measurement influenced by, or impossible because of, any non-ionospheric reason.

D Measurement influenced by, or impossible because of, the upper limit of the normal frequency range in use.

E Measurement influenced by, or impossible because of, the lower limit of the normal frequency range in use.

F Measurement influenced by, or impossible because of, the presence of spread echoes.

G Measurement influenced by, or impossible because the ionization density of the layer is too small to enable it to be made accurately.

H Measurement influenced by, or impossible because of, the presence of a stratification.

K Presence of particle *E* layer.

L Measurement influenced or impossible because the trace has no sufficiently definite cusp between layers.

M Interpretation of measurement questionable because the ordinary and extraordinary components are not distinguishable.

N Conditions are such that the measurement cannot be interpreted.

O Measurement refers to the ordinary component.

P Man-made perturbations of the observed parameter; or spur type spread *F* present.

Q Range spread present.

R Measurement influenced by, or impossible because of, attenuation in the vicinity of a critical frequency.

S Measurement influenced by, or impossible because of, interference or atmospherics.

T Value determined by a sequence of observations, the actual observation being inconsistent or doubtful.

V Forked trace which may influence the measurement.

W Measurement influenced or impossible because the echo lies outside the height range recorded.

X Measurement refers to the extraordinary component.

Y Lacuna phenomena, severe layer tilt.

Z Third magneto-electronic component present.

(ii) Qualifying Letters

The following letters are entered in the first column before a numerical value on the monthly tabulation sheets, if necessary.

A Less than. Used only when *fbEs* is deduced from *foEs* because total blanketing of higher layer is present.

D Greater than.

E Less than.

I Missing value has been replaced by an interpolated value.

J Ordinary component characteristic deduced from the extraordinary component.

M Mode interpretation uncertain.

O Extraordinary component characteristic deduced from the ordinary component. (Used for x-characteristics only.)

T Value determined by a sequence of observations, the actual observation being inconsistent or doubtful.

U Uncertain or doubtful numerical value.

Z Measurement deduced from the third magneto-electronic component.

(iii) Description of Types of *Es*

When more than one type of *Es* trace are present on the ionogram, the type for the trace used to determine *foEs* must be written first. The number of multiple trace is indicated after the type letter.

The types are:

f An *Es* trace which shows no appreciable increase of height with frequency.

l A flat *Es* trace at or below the normal *E* layer minimum virtual height or below the part *E* layer minimum virtual height.

c An *Es* trace showing a relatively symmetrical cusp at or below *foE*. (Usually a daytime type.)

h An *Es* trace showing a discontinuity in height with the normal *E* layer trace at or above *foE*. The cusp is not symmetrical, the low frequency end of the *Es* trace lying clearly above the high frequency end of the normal *E* trace. (Usually a daytime type.)

q An *Es* trace which is diffuse and non-blanketing over a wide frequency range.

r An *Es* trace showing an increase in virtual height at the high frequency end similar to group retardation.

a An *Es* trace having a well-defined flat or gradually rising lower edge with stratified and diffuse traces present above it.

s A diffuse *Es* trace which rises steadily with frequency and usually emerges from another type *Es* trace.

d A weak diffuse trace at heights below 95 km as-sociated with high absorption and large *fmin.*

n The designation 'n' is used to denote an *Es* trace which cannot be classified into one of the standard types.

k The designation 'k' is used to show the presence of particle *E*. When *foEs* > *foE* (particle *E*) the *Es* type precedes k.

c. Definitions of the CNT, MED, UQ and LQ

Median count (**CND**) is the number of values from which the median has been computed. In addition to numerical values, the count may include certain descriptive letters.

Median (**MED**) is the middle value when the numerical values are arranged in order of magnitude, or the average of the two middle values if there is an even number of values.

Upper quartile (**UQ**) is the median value of the upper half of the values when they are ranked according to magnitude; the ***lower quartile*** (**LQ**) is the median value of the lower half.

HOURLY VALUES OF foF2 AT Wakkanai

NOV. 2018

LAT. 45°10.0'N LON. 141°45.0'E SWEEP 1.0MHz TO 30.0MHz AUTOMATIC SCALING

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	37	36	36	36	36	36	34	52	58	58	64	66	89	67	61	57	59	40	34	38	38	40	42	36
2	43	42	50	42	47	44	34	48	52	57	55	56	73	61	54	56	51	44	42	45	50	52	52	49
3	47	46	50	47	48	50	42	49	54	51	58	66	40	54		55	54	42	30		40	38	42	41
4	42	38	42	38	36	32	32	44	49	61	58	58	60	54	55	47	48	A	A	A	A	36	32	34
5	40	34	A	35	37	32	A	54	56	62	82	96	70	71	72	A	66	74	72	64	52	55	66	51
6	54	50	51	52	50		34	42	51	51	54	56	55	50	51	50	23	37	A	28	A	29	34	28
7	32	34	37	34	34	29	30	67	54	A	49	59	62	57	51	52	45	32	25	32	A	28	40	40
8	36	37	41	34	34	32	26	50	54	52	54	63	61	56	60	54	54	N	A	A	40	35	32	37
9	40	39	42	40	36	39	35	49	49	54	60	64	69	59	56	57	48	28	34	36	A	38	42	44
10	42	42	39	38	39	32	29	45	58	54	61	70	69	61	61	A	66	38	A	46	48	48	44	A
11	51	51	52	52	52	49	49	48	51	51	58	A	77	65	55	56	58	40	A	34	A	38	40	46
12	51	37	32	32	31	29	32	49	46	57	58	58	64	56	65	57	59	34		A	A	32	31	34
13	34	A	36	34	32	31		43	55	65	62	70	A		A	A	59	A	A	A	A	36	34	A
14	43	43	35	34	32	34	59	N	53	48		A	65	56	46	59	51	32			34	32	37	36
15	37	36	34	32	30	28		43	48	54	57	58	64	54	45	54	51	28	30	32	32	34	34	34
16	35	36	37	34	32	29	N	43	50	54	55	61	56	54	54	51	55	30		28	29	30		31
17	30	30	31	30	29	31		40	49	52	55	64	53	52	56	55	48	44		A	36	27	A	34
18	34		32	34	28	34	28	46	54	59	62	54	62		50	54	46	34	N	28	30	A	32	32
19	32		34	32	32	34	28	50	54	60	58	59	69	62	55	54	44	32	29		34	35	34	36
20	34	34	34		32	32	32	46	55	61	67	69	79	55	59	51	52	37	37	41	36	36		36
21	50	50	50	44	42	42	32	47	54	57	58	62	67	57	56	51	52	A	A	A	36	37	36	40
22	40	37	36	35	34	37	38	52	62	70	58	58	62	53	52	A	42	A	34	36	46	40	48	50
23	50	51	52	46	49	44	40	54	54	55	54	61	61	55	52	51	47	28	29	30	40	38	34	34
24	31	34	32	31	28	59	25	46	51	58	52	60	56	51	47	44	40	29	28	32	32	34	43	48
25	40	39	36	42		43	42	47	51	58	58	61	57	48	47	45	N	28		28	59	59	A	31
26	29	31	28	30	29	26	N	40	52	A	39	58	53	52	48	33	A	A	A		34		34	52
27	40	42	52	42	34	34	28	43	30	51	A	56	A	53	50	50	40	N	26	28	32	32	34	34
28	30	28	28	28	29	29	30	44	53	62	60	64	62	54	52	48	40	A	A	32	38	38	40	40
29	35	32		32	36	37	37	47	50	62	50	68	59	53	51	48	43	28		34	42	34	36	36
30	32	32	32	32	32	28	29	45	51	N	58	56	51	54	51	52	45	29	28	30	36	36	32	34
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	27	28	29	29	29	24	29	30	27	28	28	28	28	28	26	28	22	14	20	23	28	26	28
MED	38	37	36	34	34	34	32	47	52	57	58	61	62	54	53	52	50	33	30	32	36	36	36	36
U Q	43	42	46	42	38	40	37	49	54	61	60	65	69	58	56	55	54	40	34	37	42	38	42	42
L Q	34	34	33	32	31	30	29	43	50	52	54	58	56	53	50	50	44	29	28	29	34	33	34	34

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HOURLY VALUES OF fEs AT Wakkanai

NOV. 2018

LAT. 45°10.0'N LON. 141°45.0'E SWEEP 1.0MHz TO 30.0MHz AUTOMATIC SCALING

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	G	G	25	G	24	29	G	150	33	40	51	54	60	34	93	G	G	32	G	G	G	G	G	G
2	G	G	G	G	G	23	G	48	103	38	40	43	59	50	48	147	108	11	G	G	G	26	G	34
3	33	G	34	39	31	24	11	48	39	52	53	95	57	50		49	34	27	29		41	43	G	G
4	35	G	G	45	29	24	G	45	38	33	40	39	51	34	34	36	48	39	36	34	34	33	G	G
5	34	69	70	28	58	52	70	27	40	48	146	54	54	54	41	90	40	55	58	39	37	29	27	G
6	G	24	40	35	24		G	29	33	35	49	67	92	40	34	33	31	48	58	56	35	59	32	G
7	G	G	G	G	G	G	G	G	34	54	77	49	46	G	37	32	G	G	G	27	34	34	G	27
8	G	32	38	G	G	G	G	29	32	35	G	39	36	35	34	G	26	32	38	38	33	G	G	34
9	28	G	28	G	26	39	39	26	31	34	37	46	42	51	40	53	53	91	G	40	60	54	33	G
10	34	30	26	G	G	G	G	33	40	40	54	89	172	48	56	66	G	28	34	30	G	28	34	69
11	32	24	26	G	G	G	G	48	41	42	42	70	56	G	48	40	28	53	34	33	60	27	27	27
12	26	G	G	26	G	G	G	G	34	47	45	175	34	G	G	33	36	28	G	52	45	G	40	31
13	G	39	28	82	G	24		29	34	49	68	115	110		82	78	59	61	55	41	32	G	G	45
14	34	31	26	32	25	G	G	44	G	G		111	50	93	49	32	25	G			G	G	G	G
15	G	G	G	G	G	G		44	32	39	56	39	41	G	40	G	11	G	G	G	G	G	G	26
16	27	26	G	24	G	89	G	39	49	155	34	35	52	34	34	G	11	32		G	G	G		G
17	G	G	G	G	G	G		115	52	44	48	N	G	G	G	G	27	G		46	G	28	60	27
18	G		G	G	G	G	G	G	31	110	50	40	G		G	40	39	32	G	G	G	32	G	G
19	G		G	G	94	G	G	G	31	110	36	G	G	G	36	41	34	G	G		G	G	G	G
20	G	24	G		92	G	32	G	43	36	34	G	G	37	G	40	25	G	G	G	60	28		G
21	G	G	G	G	G	G	G	33	45	33	34	G	50	G	G	G	33	34	28	33	G	G	G	G
22	G	G	G	G	G	G	G	24	32	32	G	G	54	64	57	69	34	30	G	G	G	36	G	G
23	G	G	29	32	G	G	G	54	40	34	49	42	G	33	61	G	46	G	34	28	G	31	30	G
24	G	G	G	28	24	G	G	40	34	34	39	44	54	G	48	G	11	G	G	G	G	11	G	24
25	G	G	G	G		G	G	49	29	38	58	41	51	92	42	40	11	G		G	G	G	32	G
26	G	G	26	G	G	G	G	G	32	60	58	150	45	34	39	40	40	33	24	G	G		G	G
27	33	30	26	G	G	G	G	44	36	48	69	71	83	G	G	29	11	G	G	G	G	G	G	G
28	59	G	G	G	G	G	G	133	136	43	40	40	38	33	G	28	36	41	48	26	24	25	G	G
29	G	25		G	G	G	G	G	36	53	89	34	47	38	32	47	26	G		G	G	G	G	G
30	218	G	G	86	G	G	G	46	48	G	35	36	34	33	31	49	40	G	29	26	30	G	G	G
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	28	29	29	29	29	27	30	30	30	29	29	30	28	29	30	30	30	25	27	30	29	28	30
MED	G	G	G	G	G	G	G	36	35	40	48	43	50	34	37	38	32	28	24	26	G	25	G	G
U Q	33	25	27	30	24	23	G	48	41	49	57	70	56	49	48	49	40	34	35	38	34	31	28	27
L Q	G	G	G	G	G	G	G	24	32	34	36	37	36	G	16	G	11	G	G	G	G	G	G	G

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

HOURLY VALUES OF fmin AT Wakkanai

NOV. 2018

LAT. 45°10.0'N LON. 141°45.0'E SWEEP 1.0MHz TO 30.0MHz AUTOMATIC SCALING

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	14	14	14	14	14	14	14	14	14	14	14	15	14	14	14	14	16	14	14	15	14	14	15	14
2	15	14	14	14	15	15	14	14	14	14	14	17	15	18	14	14	15	14	14	15	14	15	14	14
3	14	14	14	14	14	14	14	15	14	14	14	14	15	14		14	14	14	14		15	15	14	14
4	14	14	14	14	14	14	15	16	14	15	14	14	14	14	15	14	14	14	14	14	14	14	14	14
5	14	14	14	14	15	14	14	14	14	14	15	14	15	14	14	14	14	14	14	14	14	14	14	14
6	14	15	14	14	15		14	14	14	14	14	15	14	14	14	15	14	14	14	15	14	14	14	14
7	14	14	14	15	14	16	14	14	14	14	14	14	14	15	14	14	15	17	14	16	14	14	24	15
8	15	14	14	14	14	14	14	15	14	14	14	14	14	14	14	14	15	14	14	14	14	18	14	14
9	15	14	14	14	14	15	14	16	17	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14
10	14	15	14	15	14	14	14	14	14	14	14	14	14	14	14	14	15	15	14	14	14	16	14	14
11	14	14	14	14	14	14	14	18	14	14	15	14	14	14	14	14	14	14	15	14	14	14	14	14
12	14	14	14	14	15	14	14	14	14	14	14	14	14	14	14	14	15	14	15	14	14	17	14	14
13	14	14	14	14	14	14		14	14	14	14	14	14		14	14	14	14	14	14	15	14	15	14
14	14	14	14	15	14	14	17	14	14	14		14	14	14	14	14	15	28			16	16	16	14
15	14	14	14	14	14	15		15	14	14	14	14	14	15	15	15	14	14	14	14	14	15	14	14
16	14	15	14	14	14	14	15	16	14	14	14	14	14	14	14	15	15	14		14	14	14		14
17	14	14	15	15	14	14		15	14	14	14	15	15	15	14	14	14	14		14	14	14	14	14
18	15		14	14	14	15	14	18	14	14	14	15	14		15	14	14	14	18	15	14	15	15	14
19	14		14	14	14	14	15	16	14	14	14	14	14	14	14	14	14	14	14		14	15	14	14
20	14	14	14		14	15	14	14	14	14	14	14	14	14	14	14	15	15	14	15	14	14		14
21	14	14	15	14	14	15	14	16	14	14	15	14	15	15	23	15	14	14	15	14	15	15	15	14
22	14	14	14	14	14	14	14	16	14	15	15	15	15	14	15	14	15	15	15	14	14	14	14	14
23	14	15	14	15	14	14	14	15	14	14	14	14	14	14	14	16	15	15	14	14	14	14	15	14
24	14	14	14	14	14	14	14	16	14	14	14	14	14	14	14	21	14	21	21	14	14	14	14	14
25	14	14	14	14		14	14	14	14	14	14	14	14	14	14	16	14	14		14	14	17	14	15
26	14	14	14	14	14	14	17	16	14	14	14	14	14	14	14	14	14	14	14	22	14		14	14
27	14	14	14	14	14	14	15	15	14	14	14	14	14	14	26	14	14	15	15	14	14	14	14	15
28	15	14	14	14	14	14	14	15	14	14	14	14	14	14	14	14	14	14	14	15	15	14	14	14
29	15	14		14	14	14	14	14	14	14	14	14	14	14	14	18	15	14		17	15	14	18	14
30	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	15	14	15	15	14	14	14
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	28	29	29	29	29	27	30	30	30	29	30	30	28	29	30	30	30	25	27	30	29	28	30
MED	14	14	14	14	14	14	14	15	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14
U Q	14	14	14	14	14	14	14	16	14	14	14	14	14	14	14	15	15	15	15	15	14	15	15	14
L Q	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14

HOURLY VALUES OF foF2 AT Kokubunji

NOV. 2018

LAT. 35°43.0'N LON. 139°29.0'E SWEEP 1.0MHz TO 30.0MHz AUTOMATIC SCALING

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	27	28	27	27	N	27	46	65	50	59	67	67	67	67	69	66	63	44	28	27	34	36	31	34
2	35	34	34	35	37	34	38	50	54	67	72	67	65	62	63	60	44	34	A	31	33	34	A	32
3	34	34	34	32	36	34	35	46	N	64	58	55	56	60	58	50	55	A	A	A	27	N	34	34
4	34	32	32	37	38		32	49	49	55	55	65	57	52	56	58	51	44		A	27	27	32	34
5	31	31	31	32	31	26	34	51	66	66	74	91	73	59	71	67	56	59	48	43	38	A	42	47
6	41	41	43	42	44	32	36	52	53	63	65	66	65	62	51	59	51	34	36	N	32	32	A	A
7	A	A	A	A	28	26	32	54	54	55	59	70	55	57	50	58	47	37	N	27	31	26	32	32
8	32	A	32	31	A	A	32	52	63	65	71	54	54	56	61	69	52	21	N	27	31	34	32	28
9	32	34	30	28	32	48	30	46	53	54	60	64	68	64	63	58	54	36		26	A	32	A	A
10	32	34	34	46	45	32	35	51	51	58	62	69	68	70	69	59	54	42	26	A	35	37	36	34
11	33	36	32	32	32	32	36	63	55	50	58	63	73	86	62	57	51	46	32	A	34	58	A	34
12	36	32	A	34	32	30	28	51	63	50	59	58	68	74	66	74	55	44	31	24	27		30	31
13	34	A	32	34	34	A	34	50	62	59	63	62	61	63	56	60	58	46	27	27	31	31	35	28
14	28	34	32	30	32	N	30	45	49	51	49	60	62	71	56	45	51	46	31	26	30	34	28	30
15	30	27	26	26	27	N	27	48	48	54	54	58	52	54	58	58	47	36	32	26	37	27	30	27
16	28	23	27	28	27	N	27	43	50	55	64	58	54	57	60	63	51	47	N	25	30	27	27	A
17	27	30	27	27	27	N	26	N	46	51	56	61	51	59	N	34	52	A	35	32	35	A	26	27
18	27	27	26	34	26	25	30	48	53	52	61	63	51	61	60	53	50	A	30		30	34	34	26
19	31	30	30	32	32	N	27	49	52	51	69	64	60	58	58	49	45	39	28	N	30	31	32	A
20	30	31	27	28	28	27	34		50	54	62	67	67	59	54	51	55	N	N	25	32	27	27	28
21	34	30	27	32	34		27	50	52	51	58	64	66	64	53	52	51	39	34	33	A	30	27	28
22	28	30	31	31	30	26	30	52	63	59	51	69	63	65	49	52	51	32		35	26	N	26	26
23	32	30	30	34	34	39	34	41	47	54	55	58	56	52	50	51	50	38	26	N	31	37	36	35
24	35	35	34	34	32	34	32	44	47	54	61	N	58	54	52	47	46	31	48	34	30	32	28	28
25	26	27	A	27	26	26	N	50	35	45	51	66	61	55	54	51	46	A	A	A	A	A	26	A
26	A	A	27	25	28	N	N	42	46	49	63	58	49	41	47	54	49	35	26	27	32	30		27
27	31	28	30	26	26	27	N	44	51	54	66	59	54	56	51	51	52	A	A			27	27	A
28	27	26	26	27	26	N	26	46	54	51	62	67	57	56	51	49	44	34	A	A	A	A	A	A
29	30	26	26	N	N		27	51	58	54	57	56	58	57	53	48	43	32	30	A	26	25	A	26
30	26	27	26	27	26			49	48	47	53	54	50	59	51	44	46	N	27	N	27	32	32	28
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	28	26	27	28	27	17	26	28	29	30	30	29	30	30	29	30	30	23	18	17	25	23	23	23
MED	31	30	30	32	32	30	32	50	52	54	60	63	59	59	56	54	51	38	30	27	31	32	31	28
U Q	34	34	32	34	34	34	34	51	54	59	64	67	66	64	61	59	54	44	34	32	33	34	34	34
L Q	28	27	27	27	27	26	27	46	48	51	56	58	54	56	51	50	47	34	27	26	28	27	27	27

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

HOURLY VALUES OF fEs AT Kokubunji

NOV. 2018

LAT. 35°43.0'N LON. 139°29.0'E SWEEP 1.0MHz TO 30.0MHz AUTOMATIC SCALING

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	G	G	G	G	G	G	20	G	51	40	44	53	81	42	G	G	G	11	29	G	G	G	G	G
2	G	G	G	G	G	G	G	29	34	37	G	G	56	G	G	G	G	32	45	G	G	33	40	29
3	G	G	G	G	G	36	34	47	G	G	G	47	37	55	44	37	43	48	33	29	25	G	G	G
4	G	28	G	G	24		G	G	G	G	47	40	38	G	38	41	34	34		40	G	G	G	G
5	G	G	G	G	G	G	33	42	38	45	57	53	G	G	G	33	28	47	G	26	G	40	34	32
6	G	29	G	29	26	35	G	28	34	40	45	38	G	G	36	38	40	29	G	G	27	G	37	38
7	53	39	34	34	G	G	G	31	G	40	38	G	G	G	G	31	28	11	G	G	G	G	G	G
8	G	47	33	G	28	27	G	31	G	43	48	G	G	G	G	55	46	43	G	G	G	G	G	G
9	G	31	28	G	G	24	G	42	G	G	G	62	53	37	40	35	33	33	G	28	32	G	35	49
10	23	41	29	28	24	G	G	G	37	45	37	49	53	G	G	40	34	32	27	40	G	36	31	31
11	G	G	G	G	G	G	33	31	33	57	64	45	39	37	G	G	29	11	27	42	G	G	59	38
12	G	31	38	G	G	G	G	35	36	34	40	53	40	39	36	34	33	G	G	G	G		27	G
13	27	29	G	29	G	33	26	26	G	37	45	42	G	50	41	G	G	11	G	G	G	G	G	G
14	G	G	G	G	G	G	G	G	G	34	43	49	37	G	G	47	G	G	G	G	G	G	G	G
15	G	G	G	G	G	G	G	27	33	34	G	G	G	G	37	32	27	G	G	27	G	G	G	G
16	G	G	G	G	G	G	11	G	33	57	37	37	55	G	G	49	33	47	29	G	41	G	G	34
17	27	G	G	G	G	G	G	47	31	39	G	39	G	40	41	42	34	82	27	G	27	29	G	G
18	G	G	G	G	G	G	G	G	31	44	42	55	46	38	G	39	26	45	G		G	34	G	G
19	G	G	G	G	G	G	G	26	31	G	36	G	G	36	G	G	G	41	G	G	G	G	G	37
20	120	G	G	G	G	G	G		33	40	G	38	53	42	40	34	G	28	G	G	G	G	G	G
21	G	G	G	G	G		G	G	G	G	G	G	40	42	40	46	34	11	24	31	29	G	G	G
22	G	G	G	G	G	G	G	27	G	G	52	G	G	G	G	N	29	31		G	G	G	G	G
23	G	G	G	G	G	11	34	43	43	40	G	G	39	G	G	32	79	34	G	G	G	G	G	G
24	G	G	G	G	G	G	34	44	49	40	G	53	G	G	G	33	34	G	G	29	G	G	G	G
25	G	G	31	G	G	G	G	G	31	42	45	39	37	G	G	38	29	38	35	39	27	34	G	43
26	38	41	G	29	G	G	G	40	32	G	37	40	G	40	G	34	G	29	G	G	G	G		G
27	G	G	G	G	G	G	G	41	36	35	G	G	39	42	40	G	46	59	35		G	G	G	35
28	G	G	G	G	G	G	G	G	33	39	42	42	86	38	43	40	32	27	34	38	32	42	33	36
29	25	G	G	G	G		G	G	32	38	39	38	G	G	G	31	G	G	G	50	43	33	33	28
30	29	G	G	G	G			25	32	39	40	42	39	37	34	39	27	20	G	G	G	G	G	G
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	26	29	29	30	30	30	30	30	30	30	29	30	30	28	28	30	29	29	30
MED	G	G	G	G	G	G	G	27	32	39	38	40	38	18	G	34	29	30	G	G	G	G	G	G
U Q	23	29	G	G	G	G	15	40	34	40	45	49	46	40	40	40	34	41	28	30	27	31	32	34
L Q	G	G	G	G	G	G	G	G	G	34	G	G	G	G	G	31	G	11	G	G	G	G	G	G

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

HOURLY VALUES OF fmin AT Kokubunji

NOV. 2018

LAT. 35°43.0'N LON. 139°29.0'E SWEEP 1.0MHz TO 30.0MHz AUTOMATIC SCALING

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	15	14	15	13	14	14	14	14	14	14	26	21	20	15	14	14	20	14	13	15	14	17	21	15
2	14	14	15	14	14	18	14	13	14	15	17	18	15	18	18	14	17	14	14	13	14	13	14	17
3	13	15	15	14	13	14	13	14	13	14	15	21	21	15	20	14	15	14	15	21	13	21	18	14
4	14	13	14	14	14		17	22	14	17	24	15	20	15	18	15	14	13		14	13	20	14	14
5	14	14	14	14	14	14	13	15	14	18	14	20	15	20	17	14	20	14	18	17	17	13	14	14
6	14	14	18	14	13	13	14	13	17	17	20	21	13	20	18	13	14	13	13	15	13	14	13	14
7	14	14	14	13	15	14	13	15	17	14	17	14	21	18	20	14	13	13	14	15	17	18	14	14
8	14	14	13	17	13	14	14	13	17	14	18	17	17	21	18	13	15	17	14	17	14	14	13	14
9	14	13	14	13	13	14	17	17	15	14	14	15	15	13	14	13	14	14	14	17	14	13	13	13
10	13	14	14	14	13	13	14	13	14	14	14	21	20	18	14	14	13	14	13	13	13	14	14	13
11	14	14	13	17	14	20	14	14	13	14	15	15	20	17	20	14	13	14	17	13	14	20	14	14
12	14	14	14	14	13	15	15	20	13	13	14	14	14	13	13	15	14	15	14	18	14		17	15
13	14	14	14	13	17	14	13	15	14	13	14	13	18	17	14	14	20	14	18	14	14	14	13	17
14	14	14	14	17	17	18	14	21	14	13	14	15	14	20	21	24	21	17	14	17	14	18	17	14
15	14	14	14	14	14	14	17	14	14	14	14	15	18	35	17	14	18	17	15	14	14	18	14	15
16	14	14	18	14	13	13	13	15	13	15	18	20	14	13	18	14	14	14	14	14	14	14	14	13
17	14	15	14	14	14	17	14	18	13	14	13	15	14	20	18	13	13	15	15	15	14	15	20	13
18	14	14	14	13	14	14	14	13	13	13	14	17	17	13	14	14	14	14	14		18	14	14	14
19	13	13	15	14	14	15	18	20	17	15	18	18	13	20	15	14	17	14	17	14	13	13	14	13
20	13	15	14	14	13	13	15		14	13	22	17	14	13	14	13	20	13	21	15	14	14	13	15
21	17	13	13	13	14		14	20	14	13	18	21	18	17	22	14	18	13	14	13	13	13	14	13
22	14	14	13	15	14	14	14	14	13	15	15	20	17	17	14	15	14	17		14	13	21	15	14
23	15	14	14	14	13	14	14	14	13	13	14	18	14	14	14	14	20	14	18	18	15	14	15	13
24	14	13	14	14	13	14	13	17	17	14	15	18	17	15	15	15	14	13	20	14	18	21	14	14
25	14	14	13	13	13	15	17	18	13	14	14	20	14	14	13	14	20	13	14	13	14	13	14	13
26	14	14	14	13	13	14	14	18	13	13	14	14	18	13	14	14	18	14	17	13	15	14		18
27	13	14	14	14	14	14	14	17	13	15	14	13	17	21	15	14	14	13	14		14	15	13	13
28	14	14	14	14	13	17	17	18	15	14	14	15	14	15	14	13	14	14	14	14	14	13	13	13
29	14	14	14	14	17		14	20	13	14	14	17	14	13	14	13	18	14	17	14	13	13	13	13
30	13	14	18	13	14			14	14	14	14	17	17	17	14	14	14	13	14	14	13	14	14	13
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	26	29	29	30	30	30	30	30	30	30	30	30	30	28	28	30	29	29	30
MED	14	14	14	14	14	14	14	15	14	14	14	17	17	17	15	14	14	14	14	14	14	14	14	14
U Q	14	14	14	14	14	15	15	18	14	15	18	20	18	20	18	14	18	14	17	16	14	18	14	14
L Q	14	14	14	13	13	14	14	14	13	13	14	15	14	14	14	14	14	13	14	14	13	13	13	13

HOURLY VALUES OF foF2 AT Yamagawa

NOV. 2018

LAT. 31°12.0'N LON. 130°37.0'E SWEEP 1.0MHz TO 30.0MHz AUTOMATIC SCALING

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	26	26	26	N	30	30		39	48	53	65	77	60	50	72	68	70	50	26	A	A	59	32	29
2	31	N	31	32	36	28		45	50	62	66	79	65	58	63	58	48	53	42	A	34	A	A	59
3	31		28	31	29	34	N	43	54	53	62	67	64	60	52	60	58	48	33	N	28	29	B	34
4	32	32	A	A	36	29	26	39	47	129	50	63	62	55	55	65	64	49	36	28	59	31	28	29
5	32	28	28	32	32	B	N	44	53	66	65	72	81	59	58	84	70	54	37	32	36	34	36	36
6	28	26	29	32	30	31	28	48	66	63	58	72	73	72	56	64	50	50	40	59	32	36	A	A
7	A	A	A	29	A	B	N	42	52	64	66	80	71	57	67	60	53	48	34	49	28	30	26	32
8	34	32		A	34	A	B	42	54	70	75	66	60	54	56	80	65	49	34	B	A	B	34	29
9	30	59	32	27	32		B	40	52	54	58	74	61	61	76	71	46	N	30	A	A	49	32	A
10	A	A	A	A	34	A	29	54	49	51	60	77	A	67	87	77	64	A	A	A	A	A	A	A
11	A	A	31	31	31	30	49	46	27	55	A	A	70	75	84	62	55	56	A	A	A	A	A	A
12	A	A	32	29	32	28	B	41	53	52	49	65	70	71	65	189	66	54	34	B	B	31	49	32
13	A		31	30	34	A	30	48	53	54	57	62	58	64	70	60	64	50	A	A	22	26	30	32
14	30	30	31	28	28	32	N	41	52	52	54	54	57	57	70	60	52	48	39	N	28	35	B	N
15	28	26	26	N	28	30	N	42	52	54	57	61	56	54	58	69	51	46	49	34	49	34	34	26
16	26	26	25	25	24	B	26	42	54	54	64	61	54	50	60	71	68	N	37	A	B	29	30	29
17	A	28	28	A	29	28	N	66	N	51	48	60	54	52	60	54	63	52	40	25	29	34	26	B
18	169	28	28	28	32	B	N	41	47	54	58	A	64	59	71	67	63	45	34	34	32	34	36	49
19	N	30	28	28	34	A	N	40	51	54	64	C	54	48	59	58	50	45	34	N	28	31	A	32
20	26	28	31	29	28	26	26	41	51	53	68	64	66	58	64	64	54	64	34	49	34	30	28	26
21	30	30	30	30	32	N		37	50	54	61	66	64	58	64	53	51	48	34	A	26	30	28	28
22	129	30	36	28	34	29	26	44	51	60	60	66	74	68	60	62	50	40	34	B	28	26	B	26
23	26	28	29	30	34	35	28	34	47	51	64	56	56	54	64	57	48	52	26	N	28	30	N	26
24	28	29	32	32	36	45	32	42	55	52	64	61	62	58	51	53	52	44	32	A	26	30	26	A
25	A	26	28	28	A	30	N	33	50	54	58	64	68	62	60	51	58	47	34	26	A	A	26	26
26	A	49	A	A	59	59		34	49	60	53	65	60	54	48	56	A	49	A	A	B	A	26	B
27	28	A	28	26	28	B	26	35	46	53	60	66	52	54	53	56	51	51	36	26	49		A	A
28	A	A	28	N	26	29	B	35	54	48	57	64	53	57	55	60	40	43	A	79	30	34	A	A
29	A	A	49	28	29	26	28	38	62	51	57	57	67	62	51	57	48	43	37	34	A	A	A	A
30	A	A	59	26	N	N		40	47	47	51	55	62	60	68	53	44	43	35	N	26	25	25	26
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	18	19	25	22	27	18	12	30	29	30	29	27	29	30	30	30	29	27	25	12	20	22	18	19
MED	30	28	29	29	32	30	28	41	51	54	60	65	62	58	60	60	53	49	34	34	28	31	29	29
U Q	32	30	31	31	34	32	29	44	53	60	64	72	67	62	68	68	64	52	37	49	34	34	34	32
L Q	28	26	28	28	29	28	26	39	48	52	57	61	56	54	56	57	50	45	34	27	28	30	26	26

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

HOURLY VALUES OF fEs AT Yamagawa

NOV. 2018

LAT. 31°12.0'N LON. 130°37.0'E SWEEP 1.0MHz TO 30.0MHz AUTOMATIC SCALING

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	G	G	G	G	28	G	G	46	G	42	42	48	46	48	52	35	31	27	32	33	30	32	26	G
2	G	G	G	G	G	G	G	39	G	37	38	G	G	40	G	G	G	31	33	29	32	29	48	25
3	G	G	G	G	G	G	G	45	33	35	59	G	46	41	45	55	G	G	G	G	G	G	B	G
4	G	28	38	33	34	69	G	46	G	43	47	52	47	49	46	40	38	26	G	34	33	26	G	G
5	26	G	G	G	G	B	G	28	34	35	G	G	40	52	G	G	G	39	34	G	G	G	G	G
6	24	G	G	G	G	G	G	45	33	54	39	43	44	G	38	39	G	27	35	26	G	40	37	46
7	35	33	28	G	32	B	G	26	G	G	G	G	39	46	57	G	34	29	34	G	G	G	G	G
8	G	G	G	36	23	26	B	G	32	44	38	41	42	44	41	37	39	26	27	B	28	B	34	G
9	G	G	G	G	G	G	B	29	31	38	40	G	44	74	64	67	44	32	23	39	33	G	54	43
10	28	41	33	46	34	49	26	48	36	41	109	39	82	48	60	50	49	69	64	56	79	59	35	25
11	29	29	G	G	G	G	G	41	33	41	88	78	65	52	45	61	34	52	50	53	41	33	60	35
12	39	46	35	G	G	G	B	34	32	G	42	43	G	41	45	41	34	35	35	B	B	G	G	G
13	43	G	G	G	28	38	36	41	G	G	47	G	53	43	G	G	35	29	31	23	G	32	G	G
14	G	G	G	G	G	11	G	43	30	G	39	G	43	41	G	40	G	G	40	11	G	G	B	G
15	G	G	G	G	G	G	G	25	34	G	54	G	70	G	42	34	G	G	32	G	24	G	G	G
16	G	G	G	G	G	B	G	35	31	35	38	62	G	44	G	48	37	34	32	35	B	G	G	G
17	39	G	26	29	27	G	25	40	30	48	40	G	G	42	41	40	40	28	23	G	G	G	G	B
18	G	G	26	G	G	B	G	27	40	44	42	92	42	45	84	G	38	45	28	G	G	G	G	G
19	G	G	G	G	G	26	G	G	G	G	G	C	39	37	G	G	30	G	11	G	G	G	26	G
20	G	G	27	G	G	G	G	43	G	G	41	G	42	G	G	G	30	G	34	G	G	23	23	G
21	25	G	G	G	G	11	G	36	35	40	42	G	44	44	41	G	50	G	32	40	G	G	G	G
22	G	G	G	G	G	G	G	40	G	G	45	44	40	38	42	41	34	G	11	B	G	26	B	G
23	G	G	G	G	G	11	11	28	41	46	44	50	43	43	38	35	31	29	26	G	G	G	G	G
24	G	G	G	G	G	11	39	40	G	40	42	45	44	44	G	40	G	G	33	39	G	38	G	26
25	33	G	G	G	34	G	27	G	G	39	50	42	46	40	37	34	35	24	G	33	32	28	G	26
26	58	G	46	41	G	24	G	27	31	38	40	37	43	G	44	41	60	35	33	34	B	32	G	B
27	29	39	27	24	G	B	29	57	49	G	G	47	47	50	41	41	36	34	26	G	11	G	27	38
28	25	34	24	28	G	G	B	G	34	40	40	42	46	44	47	45	32	G	40	41	25	27	29	54
29	52	43	27	26	G	24	25	G	32	37	40	44	41	41	36	39	34	36	29	21	27	35	57	40
30	54	41	31	G	G	G	G	G	34	40	48	47	62	43	43	34	32	30	G	G	G	26	26	G
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	25	26	30	30	30	30	29	30	30	30	30	30	30	30	27	27	29	27	28
MED	12	G	G	G	G	G	G	36	32	38	42	42	44	43	41	39	34	28	32	23	G	23	G	G
U Q	33	29	27	24	23	24	25	43	34	41	47	47	46	46	45	41	38	34	34	35	30	32	34	26
L Q	G	G	G	G	G	G	G	26	G	G	39	G	40	40	G	G	30	G	23	G	G	G	G	G

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HOURLY VALUES OF fmin AT Yamagawa

NOV.2018

LAT.31°12.0'N LON.130°37.0'E SWEEP 1.0MHz TO 30.0MHz AUTOMATIC SCALING

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	20	15	16	16	15	17	15	18	15	16	20	18	21	18	20	18	15	17	14	14	15	15	15	15
2	17	21	16	15	17	15	17	15	15	17	18	18	20	17	18	16	15	15	14	15	14	16	15	15
3	18	26	15	15	17	16	15	18	15	15	18	36	21	20	18	20	20	17	16	18	17	15	B	14
4	15	15	14	15	15	15	71	17	15	15	15	17	16	18	20	17	15	16	15	15	15	15	15	16
5	15	18	15	15	14	B	16	15	15	15	17	20	18	20	17	18	23	14	15	15	15	15	14	14
6	14	18	15	15	15	15	15	16	15	16	20	20	20	21	18	20	16	17	14	14	15	14	15	14
7	16	14	14	14	15	B	17	17	14	14	15	15	16	16	15	15	15	14	15	15	15	20	16	15
8	14	14	66	15	14	15	B	17	15	14	15	17	18	17	20	20	16	18	17	B	15	B	14	16
9	15	16	17	16	16	17	B	14	15	15	15	18	17	16	17	15	15	14	15	14	14	15	14	14
10	15	14	14	15	15	15	15	18	15	15	17	22	21	17	18	16	15	14	16	15	15	14	15	15
11	14	15	15	15	16	15	15	17	15	16	20	15	21	21	20	17	15	15	14	15	15	15	14	14
12	14	15	17	17	20	14	B	14	14	14	15	15	16	15	15	15	14	15	15	B	B	17	17	15
13	15	26	15	16	14	15	18	17	15	15	17	15	16	15	15	16	16	15	14	17	21	15	15	16
14	15	14	15	16	14	15	18	14	15	14	16	18	20	18	16	20	15	18	15	18	16	15	B	15
15	15	14	15	18	17	15	18	17	14	15	16	17	20	33	18	16	17	18	15	15	15	15	15	66
16	15	17	17	14	14	B	14	15	14	14	16	18	15	17	15	15	15	14	14	14	B	15	15	15
17	15	14	14	15	15	14	15	17	15	15	15	20	20	17	17	17	15	14	15	15	15	15	18	B
18	17	16	15	14	15	B	14	17	15	15	15	15	18	18	18	16	14	15	15	15	15	15	16	16
19	21	15	15	15	15	17	15	17	14	15	15	C	18	16	20	18	16	18	14	14	15	15	15	16
20	15	14	15	14	14	14	15	15	15	16	16	17	23	18	21	15	15	15	14	15	17	15	14	15
21	15	14	15	15	14	14	16	16	14	15	15	17	16	20	22	17	15	17	14	15	16	15	16	15
22	16	15	14	15	14	15	15	15	16	14	15	21	17	16	17	16	15	18	14	B	14	14	B	15
23	16	14	14	14	14	15	15	16	14	14	15	15	18	18	20	15	15	15	16	17	15	17	18	15
24	14	14	14	14	14	15	14	15	15	15	15	15	15	20	18	17	23	17	15	14	15	14	15	15
25	14	14	14	15	14	15	15	16	15	14	15	16	18	17	17	15	15	17	15	17	14	15	15	15
26	15	15	15	14	15	15	15	15	14	16	15	15	16	17	18	15	15	14	14	14	B	14	14	B
27	14	14	14	15	15	B	14	16	14	14	16	15	16	14	20	16	15	16	14	16	14	23	21	15
28	17	14	15	15	15	14	B	15	14	14	15	15	15	17	17	14	14	18	17	14	15	15	14	15
29	15	14	14	15	14	15	14	15	14	15	15	15	15	15	15	14	14	14	14	14	15	15	14	14
30	14	15	15	14	14	14	66	15	14	15	15	15	17	17	15	15	14	15	15	15	14	14	15	16
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	25	26	30	30	30	30	29	30	30	30	30	30	30	30	27	27	29	27	28
MED	15	15	15	15	15	15	15	16	15	15	15	17	18	17	18	16	15	15	15	15	15	15	15	15
U Q	16	16	15	15	15	15	17	17	15	15	17	18	20	18	20	17	16	17	15	15	15	15	16	15
L Q	14	14	14	14	14	14	15	15	14	14	15	15	16	16	17	15	15	14	14	14	15	15	14	15

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HOURLY VALUES OF foF2 AT Okinawa

NOV.2018

LAT.26°41.0'N LON.128°09.0'E SWEEP 1.0MHz TO 30.0MHz AUTOMATIC SCALING

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	26	26	26	26	31	29		41	54	55	54	81	70	55	60	80	83	67	64	41	A	36	37	28
2	30	30	28	28	34	B	N	46	55	55	61	90	74	64	52	64	66	55	45	39	A	30	49	32
3	29	30	29	28	29	29	N	43	51	61	55	72	88	82	60	73	63	54	43	44	34	35		36
4	36	34	32	A	37	A	N	41	30	75	55	61	74	68	62	71	77	52	44	37	32	37	31	A
5	30	31		32	32	N	N	42	54	55	67	71	96	86	87	105	86	72	42	32	40	36	36	43
6		25	N	26	26	26	B	50	54	62	66	80	70	78	70	58	65	52	45	43	A	51	48	A
7	A	A	29	29	28	A	A	52	54	55	74	90	105	106	86	67	57	39	N	30	N	28	30	32
8	30	30	30	35	N	B	B	42	54	67	74	86	62	63	67	88	79	58	47	30	30	N	34	A
9	30	30	30	30	33	B	B	41	52	57	65	75	72	68	84	100	71	58	34	30	A	A	A	32
10	32	A	28	A	A	B	B	46	53	54	67	90	78	77	99	100	72	52	A	A	A	34	A	A
11	35	39	29	29	29	26	B	46	55	54	64	65	69	99	111	91	66	65	65	40	28	A	A	A
12	31	30	30	B	28	B	B	40	54	49	A	67	78	82	78	77	76	70	54	35	A	A	N	28
13	29	28	A	28	31	29	B	47	159	55	65	65	64	74	91	81	77	52	53	36	26	30	32	34
14	32	34	32	30	32	28	N	40	51	52	58	66	54	66	77	86	63	51	52	42	26	34	29	29
15	28	28	26	26	26	28	N	45	51	54	55	66	56	66	66	67	69	58	40	A	A	34	34	N
16	N	N	26	26	B	26	26	40	53	54	54	62	64	64	65	74	75	60	51	47	26	31	32	34
17	34	32	34	31	31	28	N	41	48	54	55	65	65	57	57	66	60	60	52	35	34	32	31	31
18	28	26	26	26	29	26	A	40	51	50	A	A	82	91	91	94	86	55	44	45	40	41	40	30
19		30	31	30	31	N	B	40	47	52	67	82	65	72	64	71	65	50	40	29	34	B	28	A
20	B	28	30	28	28	N	B	38	50	51	72	85	67	65	60	76	85	52	57	50	31	32	30	A
21	26	29	30	30	31	28	A	35	47	52	65	78	47	62	62	60	58	54	26	34	A	N	28	28
22	28		30	31	32	19	A	43	50	62	64	63	77	86	78	60	76	51	44	31	A	32	28	29
23	29	30	32	34	40	34	A	38	45	55	60	66	75	69	67	68	54	50	43	30	22	N	A	N
24	26	28	28	28	40	32	N	38	50	52	65	65	71	72	86	68	62	48	38	49	28		N	B
25	N	26	A	28	28	A	B	34	50	54	55	70	82	86	98	85	72	58	A	64	A	30	A	N
26	28	26	A	49	N	A	A	26	50	58	61	62	56	69	55	54	60	A	25	A	A			28
27	26	28	28	A	28	28	A	34	45	55	60	70	77	72	72	69	68	58	40	34	B	69	99	N
28	28	N	A	A	A	59	A	36	32	65	52	65	A	66	A	75	57	A	49	A	A	A	A	B
29	N	25	A	A	26	N	N	40	52	42	56	67	63	67	69	70	67	56	51	40	A	A	A	A
30	A	A	A	A	30	34	31	42	33	40	50	56	67	71	54	60	50	A	37	30	N	59	59	B
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	22	24	22	23	25	17	2	30	30	30	28	29	29	30	29	30	30	27	27	26	14	19	19	15
MED	29	30	30	29	31	28	28	41	51	54	61	67	70	70	69	72	68	55	44	36	30	34	32	31
U Q	31	30	30	31	32	30	31	43	54	57	65	80	77	82	86	85	76	58	52	43	34	37	40	34
L Q	28	27	28	28	28	26	26	38	48	52	55	65	64	66	61	67	62	52	40	31	26	31	30	28

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HOURLY VALUES OF fEs AT Okinawa

NOV. 2018

LAT. 26°41.0'N LON. 128°09.0'E SWEEP 1.0MHz TO 30.0MHz AUTOMATIC SCALING

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	G	G	G	G	G	21	G	32	72	41	46	45	52	50	48	47	40	28	38	36	34	G	G	G
2	G	G	G	G	38	B	G	37	G	41	44	41	41	44	47	48	39	30	43	32	26	26	G	G
3	G	G	G	G	G	G	G	44	46	56	47	45	48	55	40	36	54	G	37	34	G	G		G
4	G	G	G	46	26	29	G	45	36	39	47	46	47	49	46	42	36	31	11	G	27	46	G	41
5	26	G		G	G	G	G	26	34	45	41	46	43	43	46	67	52	34	40	G	G	G	G	G
6	G	G	G	G	G	G	B	44	52	40	38	144	40	41	51	38	33	G	31	33	47	33	G	39
7	24	27	24	28	26	32	25	36	33	41	G	G	G	54	92	41	45	45	19	G	G	25	G	G
8	G	G	G	G	27	B	B	G	33	45	41	43	57	45	47	44	90	34	36	G	G	G	G	143
9	G	G	G	G	G	B	B	24	32	44	54	56	96	53	44	42	33	48	34	25	30	31	43	46
10	59	28	27	34	46	B	B	33	178	42	G	45	46	52	47	55	45	78	59	60	60	28	58	60
11	29	25	32	G	G	G	B	44	33	54	42	59	92	84	88	47	93	69	11	40	G	35	59	45
12	G	G	G	B	G	B	B	28	48	44	73	49	43	44	47	G	55	27	49	28	28	39	G	G
13	G	27	28	G	G	G	B	60	G	43	G	46	47	47	45	36	G	28	35	35	G	G	G	G
14	26	G	24	G	G	G	G	26	G	40	37	44	46	45	43	G	36	33	11	41	G	G	G	G
15	G	G	G	G	94	G	G	24	33	36	44	44	43	106	G	40	48	33	34	88	86	G	G	G
16	G	G	G	G	B	G	G	151	31	36	50	46	46	47	44	41	34	33	24	47	G	G	G	G
17	G	G	G	G	G	32	G	89	G	37	40	41	49	50	43	40	38	28	19	117	G	G	G	G
18	G	G	G	G	G	G	26	G	31	36	80	106	41	48	48	48	33	G	36	44	G	G	G	G
19		G	G	G	G	11	B	40	G	38	57	41	44	G	G	39	32	32	25	G	26	B	G	26
20	B	G	G	G	G	G	B	32	48	41	G	G	45	45	42	37	37	32	24	40	25	G	23	32
21	G	G	G	27	G	G	25	30	45	71	43	46	44	76	40	46	50	45	33	35	55	25	G	G
22	G		G	G	G	25	36	23	G	41	36	38	43	44	53	40	36	45	23	28	33	40	G	G
23	G	G	G	G	G	36	24	32	46	40	41	49	45	46	69	42	34	G	41	G	137	G	24	G
24	G	G	G	G	G	28	G	26	G	41	41	43	91	46	41	36	32	30	28	32	G		G	B
25	G	27	38	G	G	146	B	36	G	40	G	46	47	44	44	48	35	32	47	32	32	28	34	27
26	G	26	59	29	46	49	28	29	35	35	39	41	115	64	47	47	58	73	60	55	30	G		G
27	G	G	G	44	24	28	24	34	40	83	G	G	87	43	152	46	40	28	37	35	B	G	G	G
28	G	G	34	45	137	G	38	27	38	48	68	46	94	84	92	54	48	50	39	41	57	32	39	B
29	G	G	43	34	28	G	G	26	32	41	45	54	52	52	54	49	49	29	24	29	37	50	32	30
30	79	46	65	39	26	G	G	22	38	40	48	51	61	66	55	58	58	87	29	G	G	G	G	B
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	28	29	29	29	29	25	20	30	30	30	30	30	30	30	30	30	30	30	30	30	29	28	28	27
MED	G	G	G	G	G	G	G	32	33	41	42	46	46	48	47	42	40	32	34	34	26	G	G	G
U Q	G	13	27	28	26	28	25	40	45	44	47	49	57	54	53	48	50	45	39	41	35	31	23	32
L Q	G	G	G	G	G	G	G	26	G	40	37	41	43	44	43	39	34	28	24	25	G	G	G	G

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HOURLY VALUES OF fmin AT Okinawa

NOV. 2018

LAT. 26°41.0'N LON. 128°09.0'E SWEEP 1.0MHz TO 30.0MHz AUTOMATIC SCALING

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	14	14	14	14	14	14	101	17	14	14	14	15	15	15	14	14	14	14	14	14	14	14	15	14
2	14	14	14	14	14	B	16	14	14	14	14	16	17	18	15	15	14	14	14	15	14	14	15	14
3	14	14	15	14	14	14	15	14	14	14	15	17	17	17	17	15	14	14	14	14	14	14		14
4	17	14	14	14	14	14	14	15	14	14	15	14	15	14	14	14	14	14	14	15	14	14	14	14
5	14	14		14	14	16	15	14	14	14	14	16	15	14	14	14	14	14	14	15	14	15	14	14
6	15	14	14	14	14	14	B	15	14	14	15	18	16	18	14	14	14	14	14	14	14	14	15	15
7	14	14	14	14	14	14	14	14	14	14	14	14	14	14	18	14	14	14	14	14	16	14	14	14
8	14	15	15	15	15	B	B	16	14	14	14	16	14	15	14	17	14	14	14	14	15	15	14	15
9	14	14	15	14	15	B	B	17	14	14	14	14	15	14	18	15	14	14	14	16	14	14	14	14
10	14	14	14	14	15	B	B	16	14	14	14	16	15	15	14	14	14	14	14	15	14	14	14	14
11	14	14	14	14	14	15	B	17	14	14	14	14	14	15	14	14	14	14	14	14	15	14	14	14
12	14	14	14	B	14	B	B	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	15
13	14	14	14	15	14	14	B	15	14	14	14	17	14	14	14	14	14	14	14	14	14	15	14	14
14	15	15	14	14	14	14	15	16	14	14	14	14	16	17	14	14	15	14	14	15	66	14	14	14
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16	15	14	15	15	B	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	15	14	15	14
17	14	14	14	14	14	14	17	16	14	14	14	17	14	14	14	14	14	14	14	15	14	15	15	14
18	14	15	14	15	15	15	15	15	14	14	14	14	17	14	15	14	14	14	14	15	14	15	15	14
19		14	14	14	14	14	B	16	14	14	14	14	14	18	14	14	15	16	15	15	14	B	14	14
20	B	14	14	14	14	14	B	17	14	14	14	14	16	15	15	14	14	14	14	14	14	14	14	14
21	15	14	16	14	14	14	15	16	14	14	14	14	15	15	14	14	14	14	14	14	14	15	14	14
22	14		14	14	14	14	14	14	14	14	14	15	15	17	14	14	14	15	15	16	14	16	15	14
23	14	14	14	15	14	14	17	16	14	14	15	15	16	17	15	14	14	14	14	14	14	17	14	15
24	14	14	14	14	14	14	15	14	14	14	14	14	14	15	14	14	14	14	15	14	14		14	B
25	14	14	14	14	14	14	B	15	14	14	14	15	15	15	14	15	14	14	14	14	14	14	14	14
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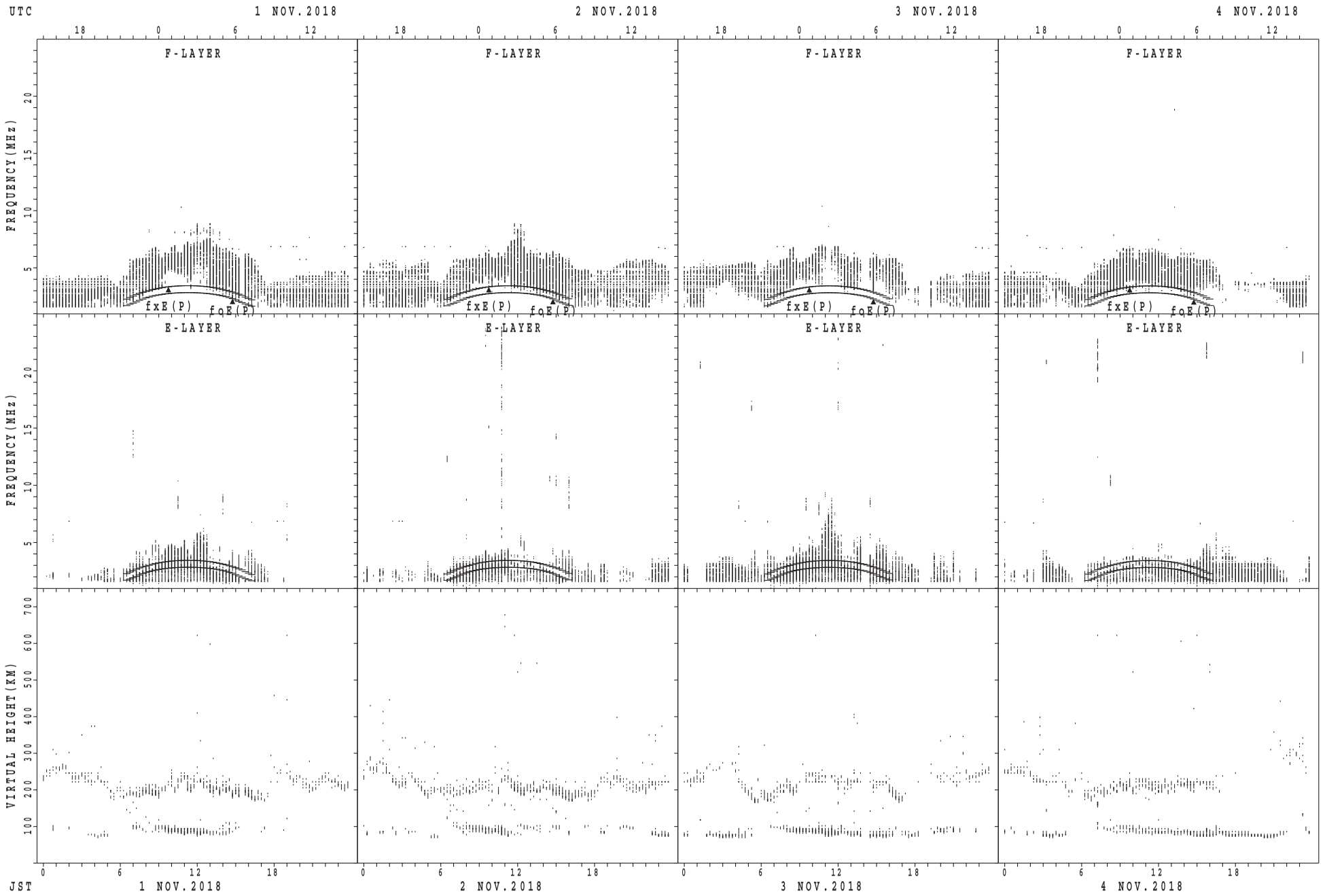
30	14	15	15	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	B
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	28	29	29	29	29	25	20	30	30	30	30	30	30	30	30	30	30	30	30	30	29	28	28	27
MED	14	14	14	14	14	14	14	15	14	14	14	14	15	15	14	14	14	14	14	14	14	14	14	14
U Q	14	14	14	14	14	14	15	16	14	14	14	16	15	17	15	14	14	14	14	15	14	15	14	14
L Q	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14

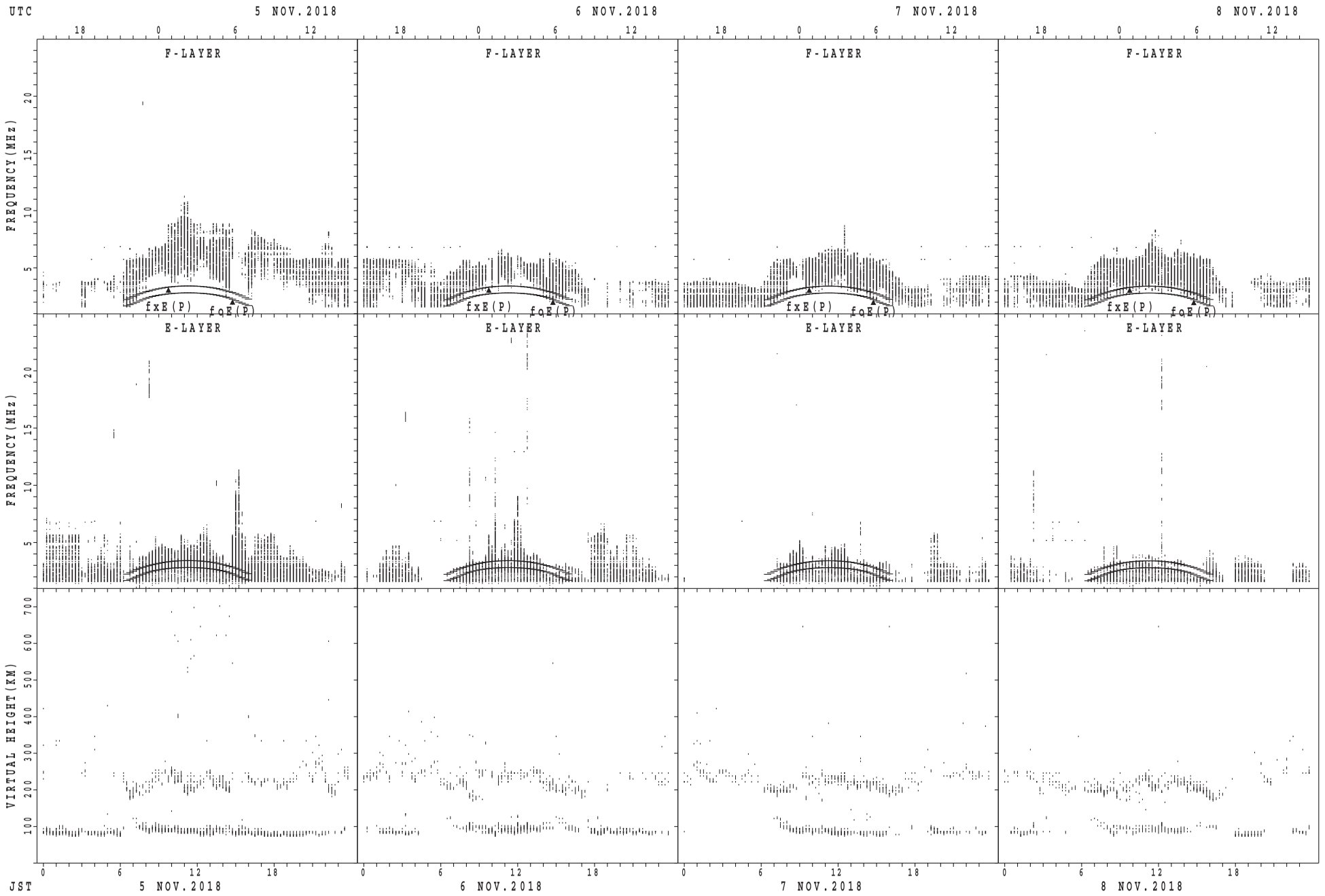
NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

SUMMARY PLOTS AT Wakkanai



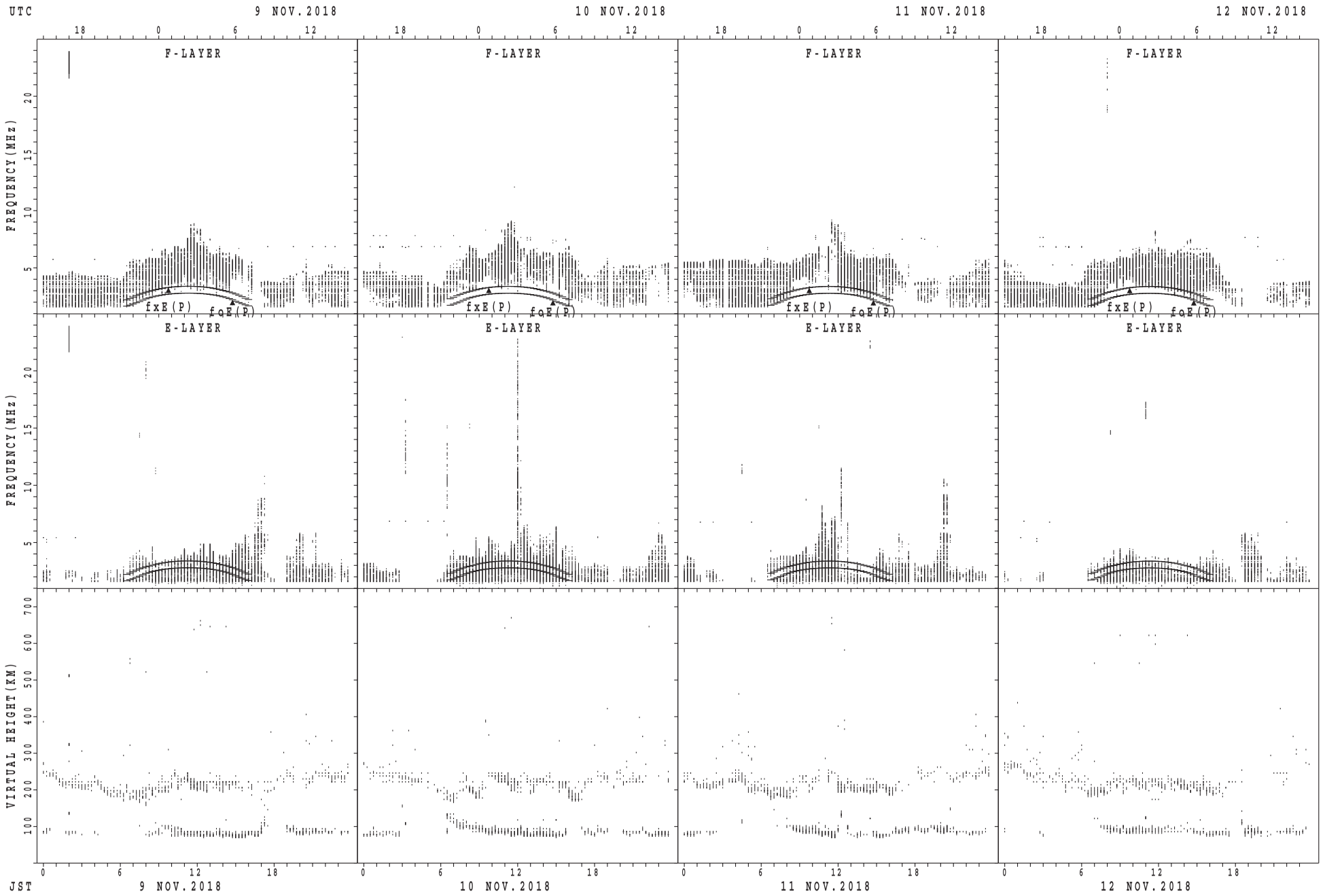
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



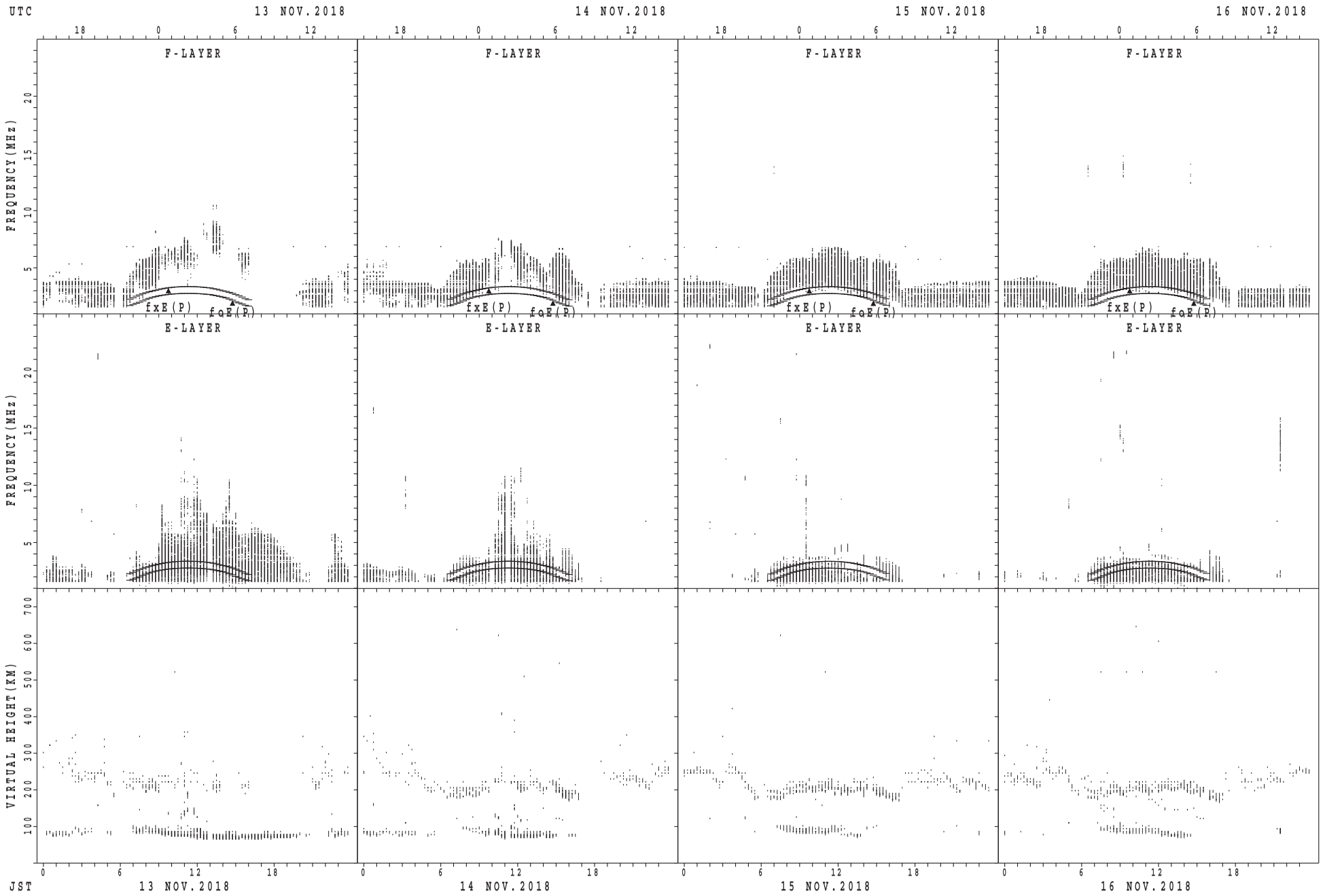
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



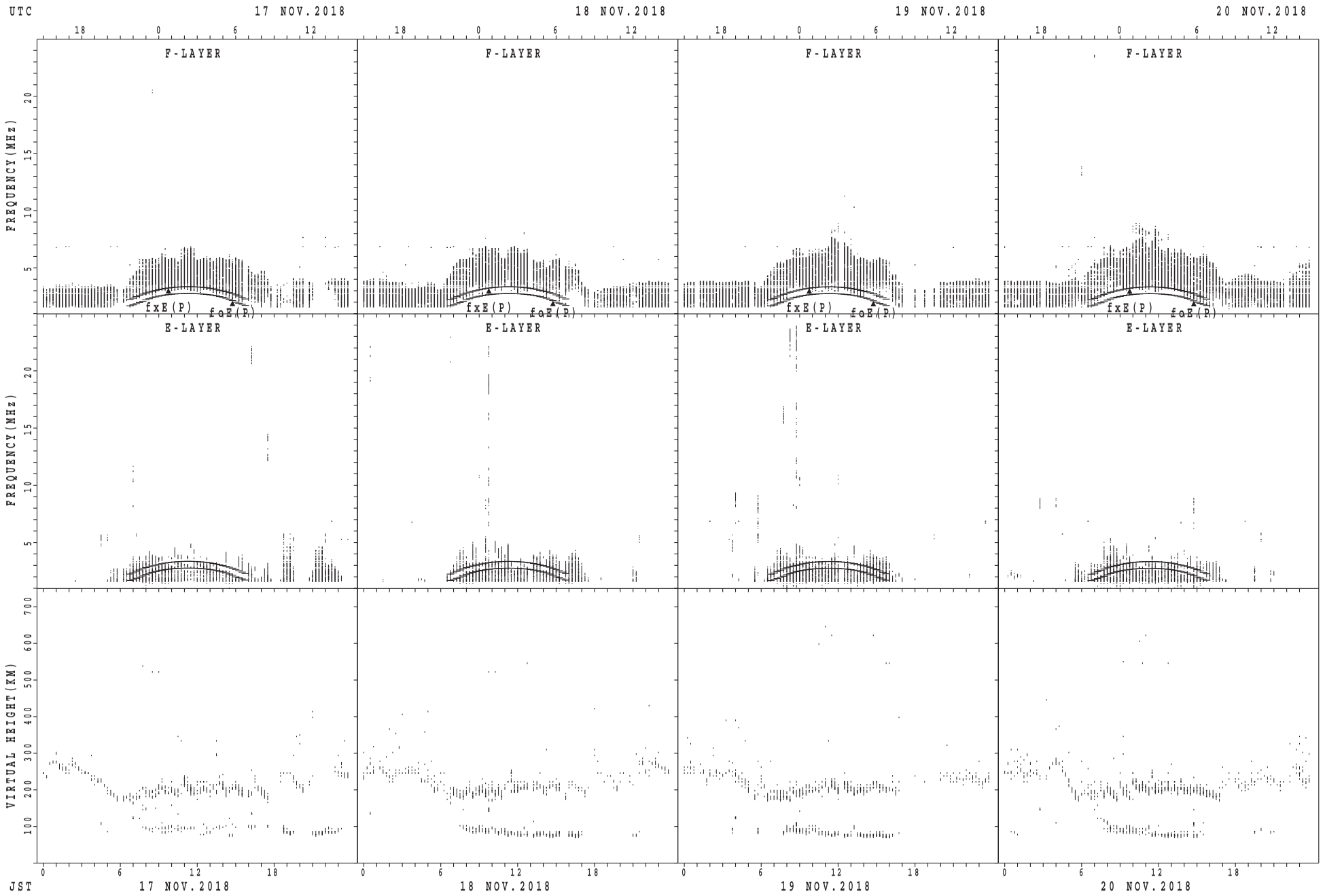
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



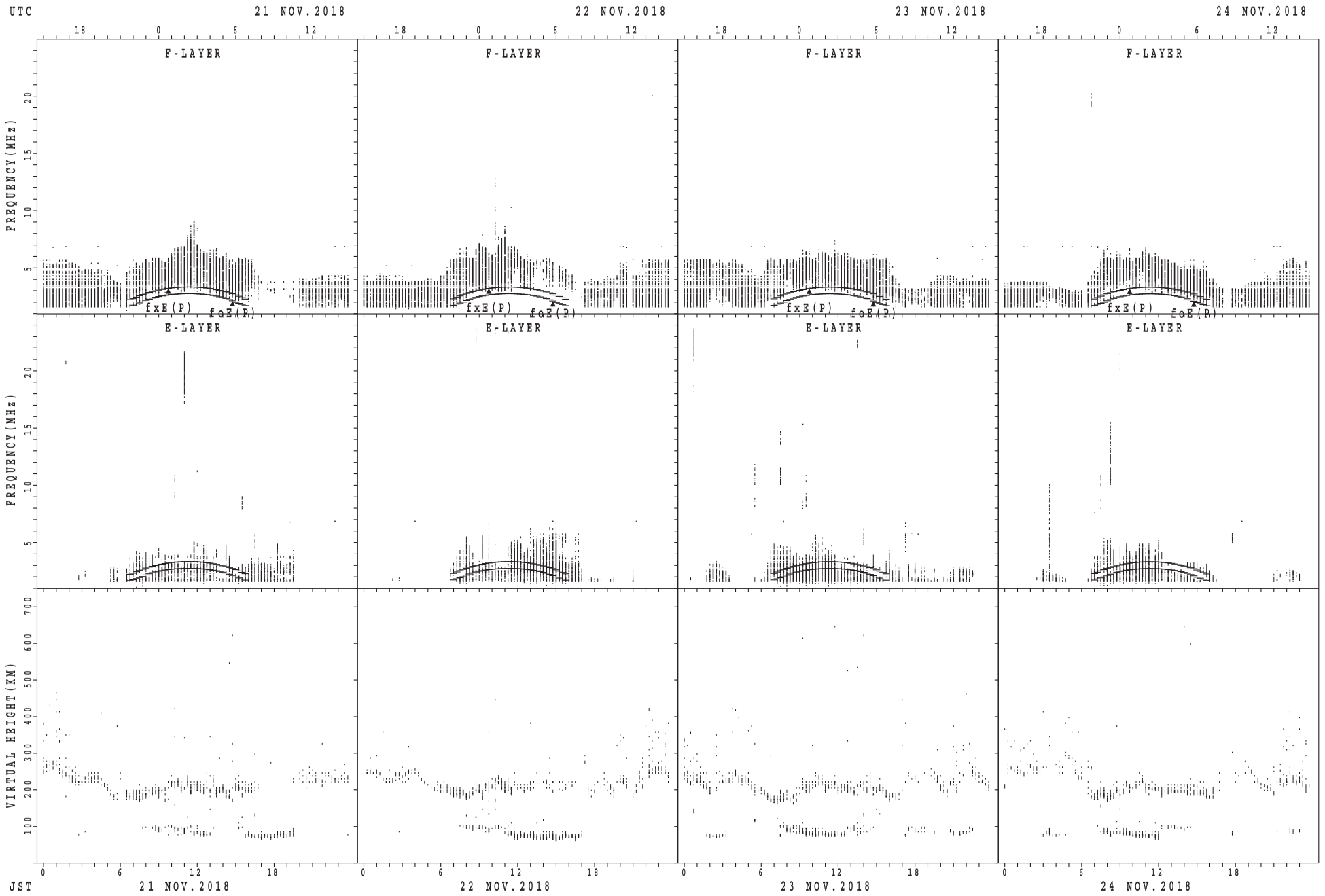
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



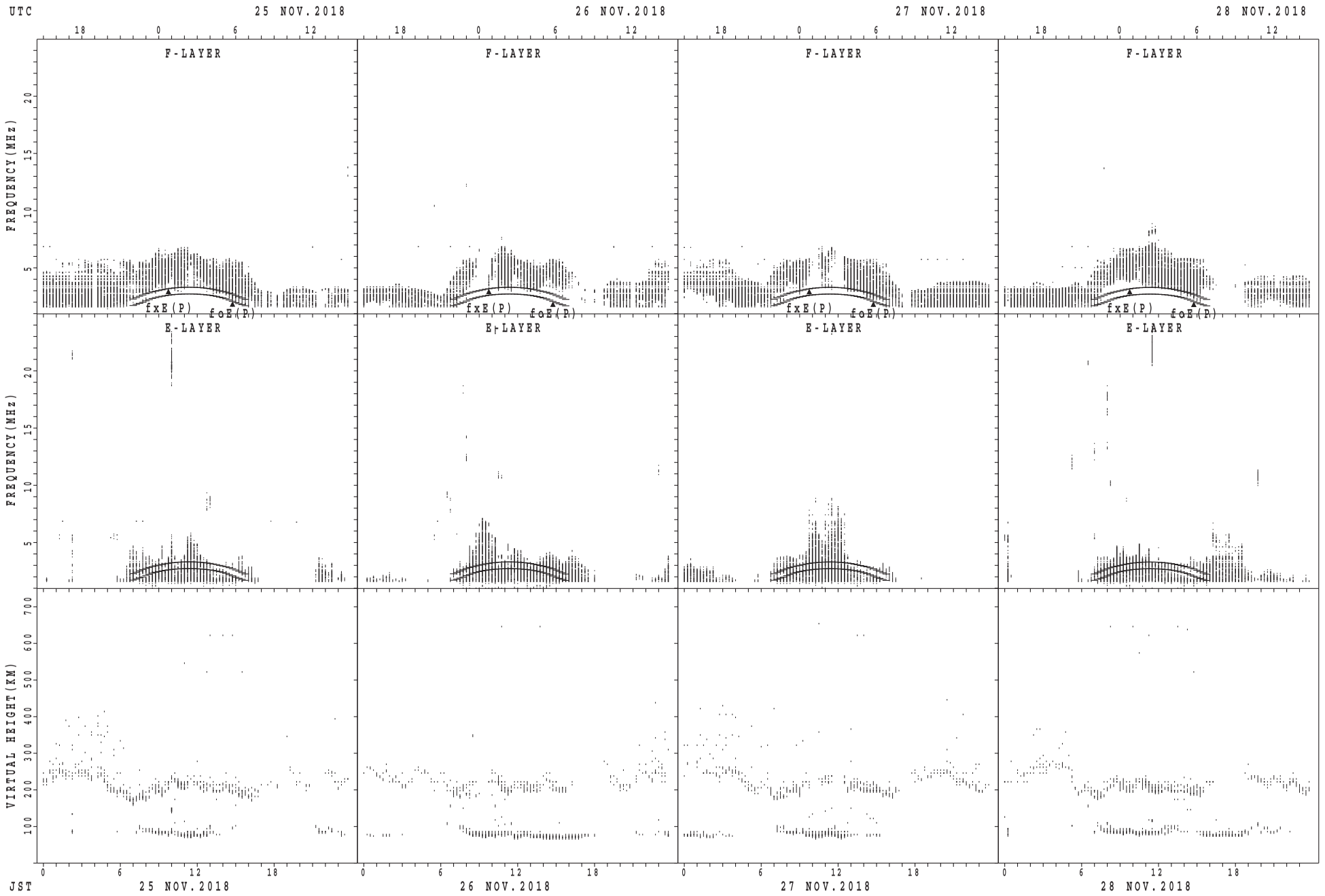
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



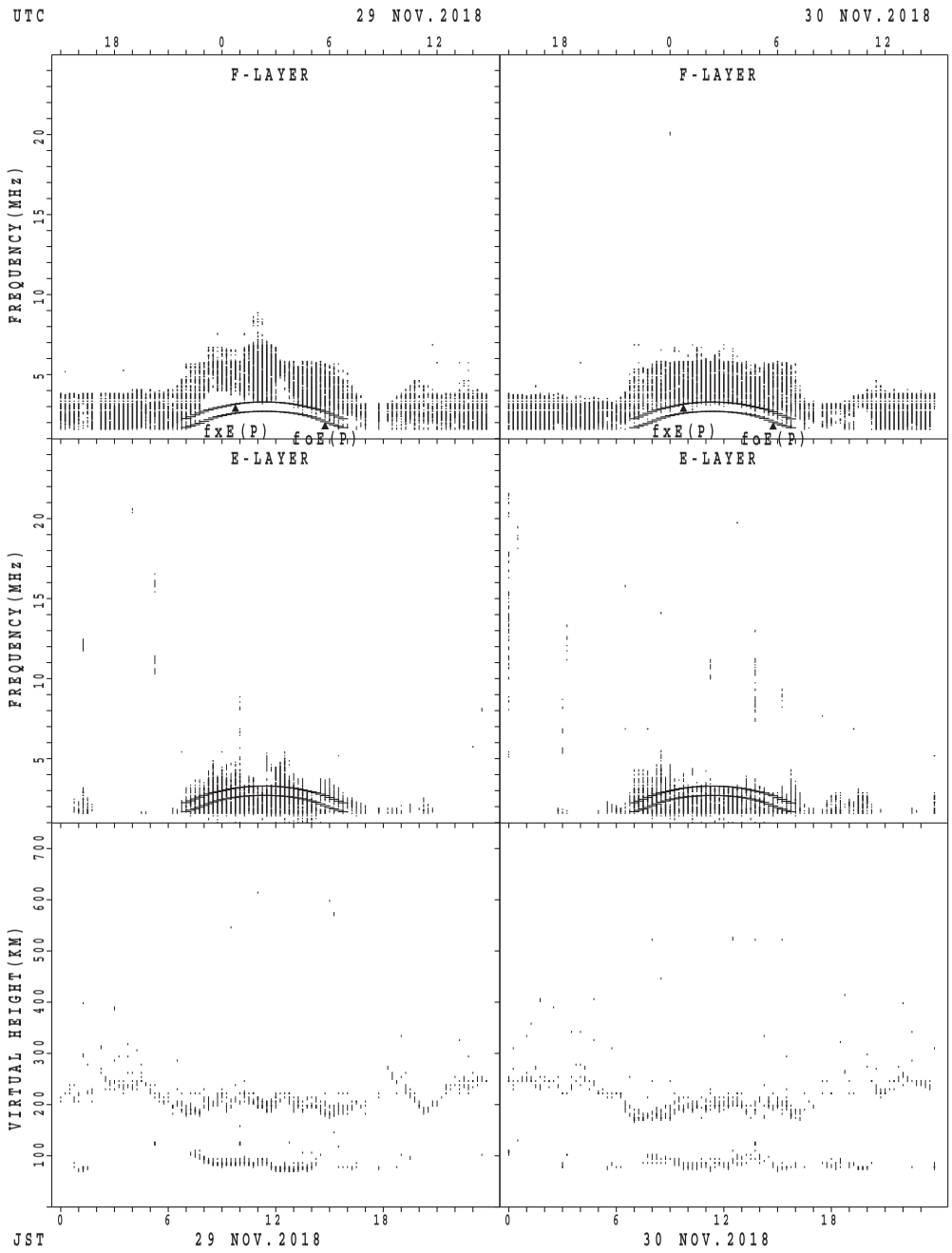
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



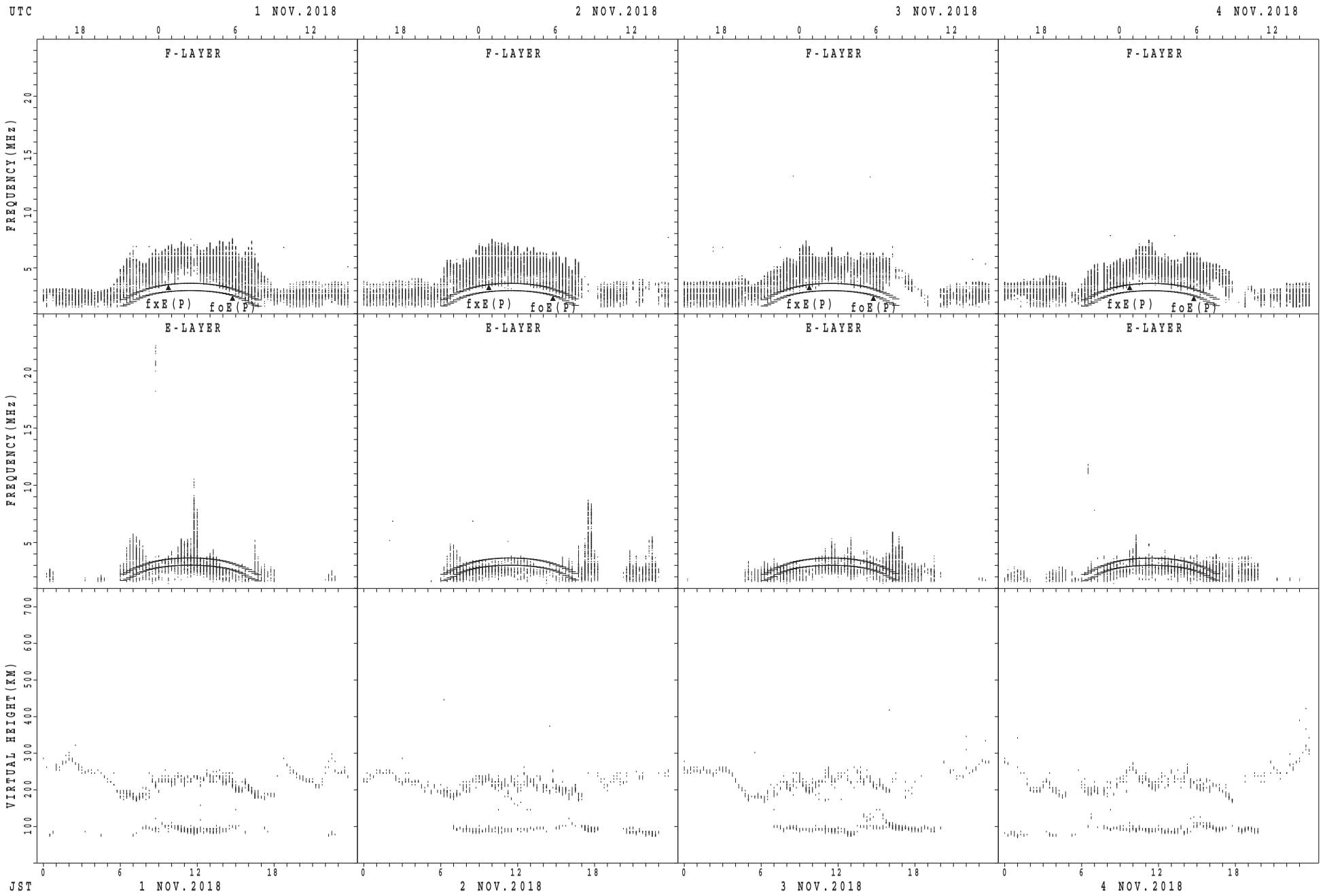
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



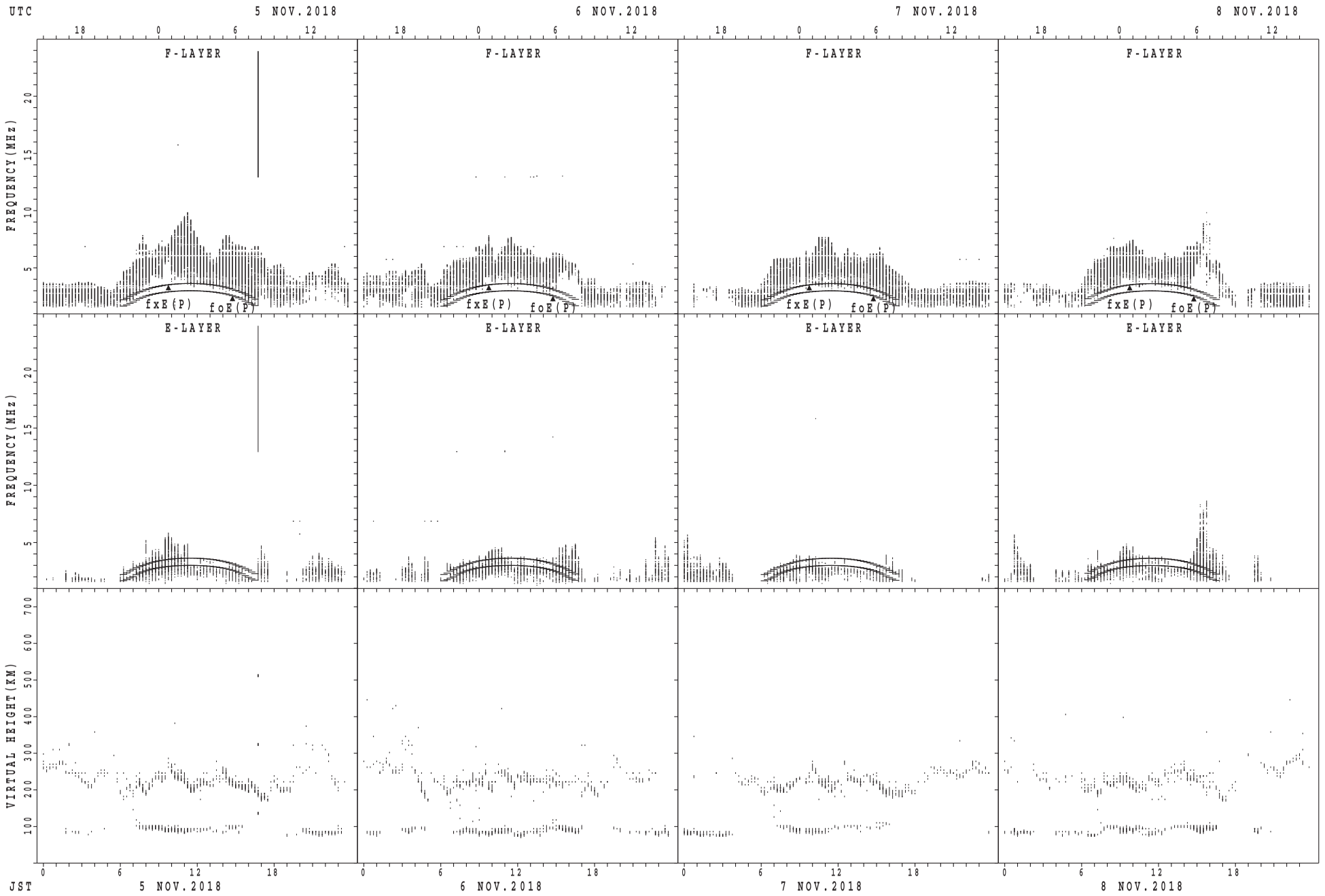
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji

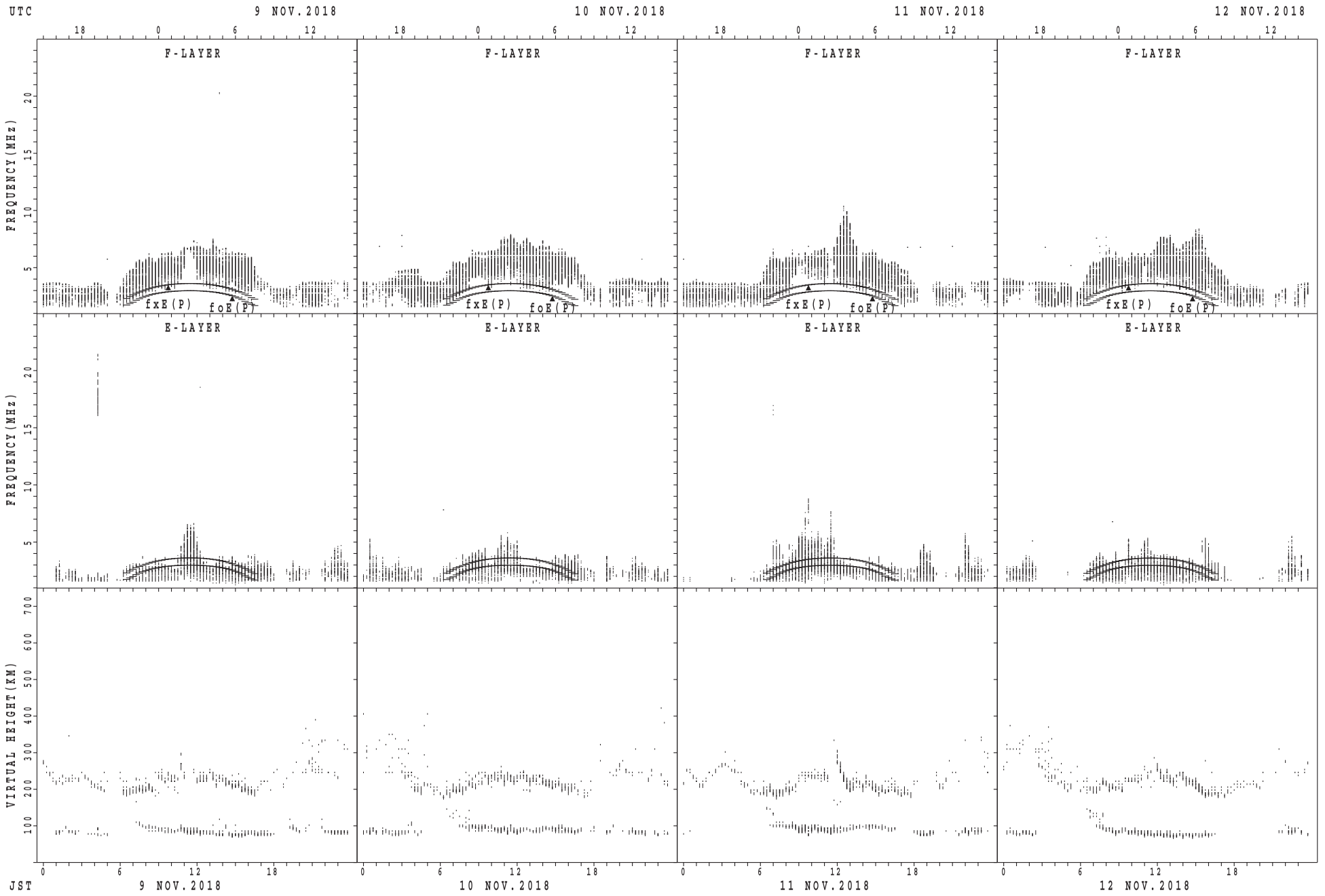


fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

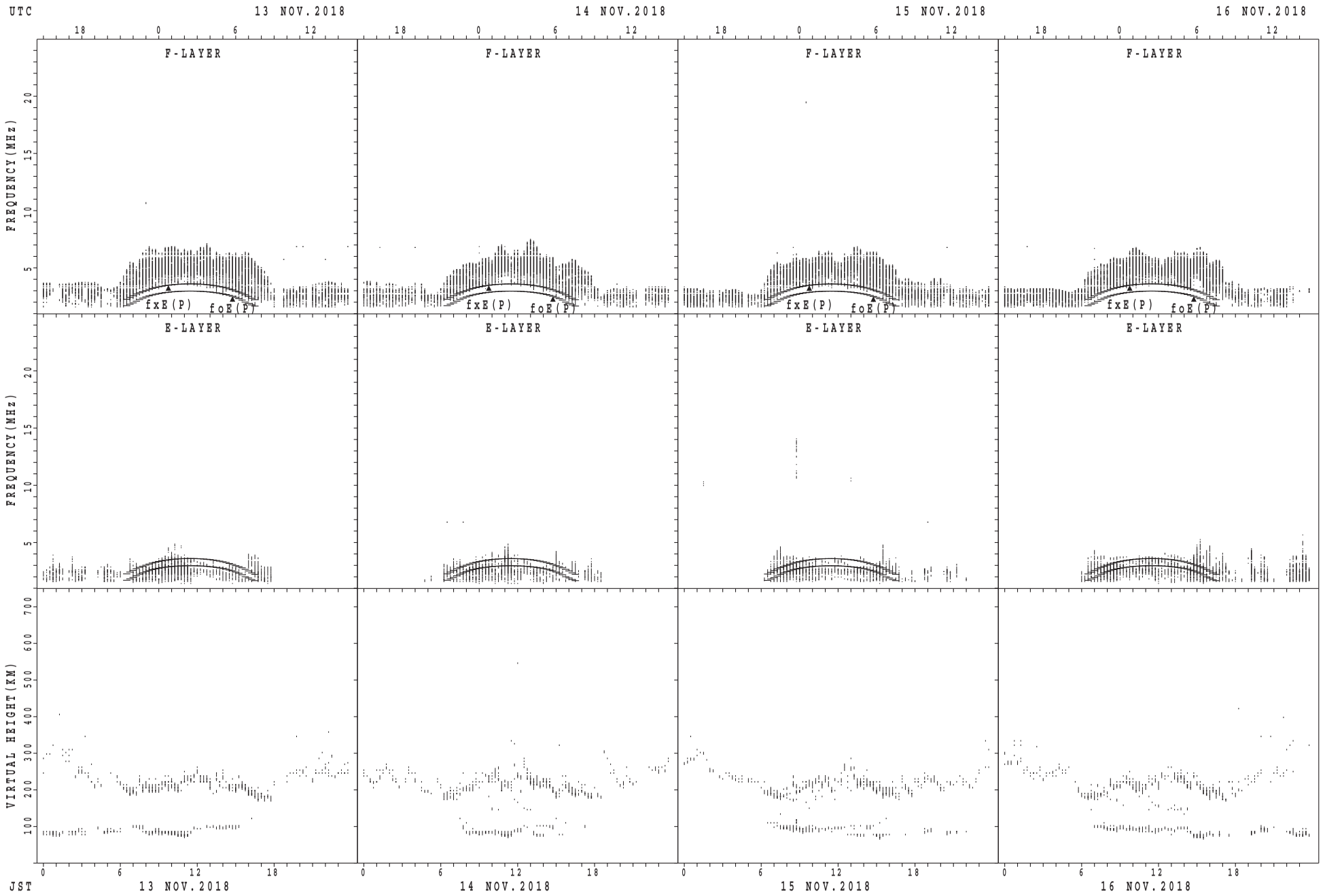
SUMMARY PLOTS AT Kokubunji



fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

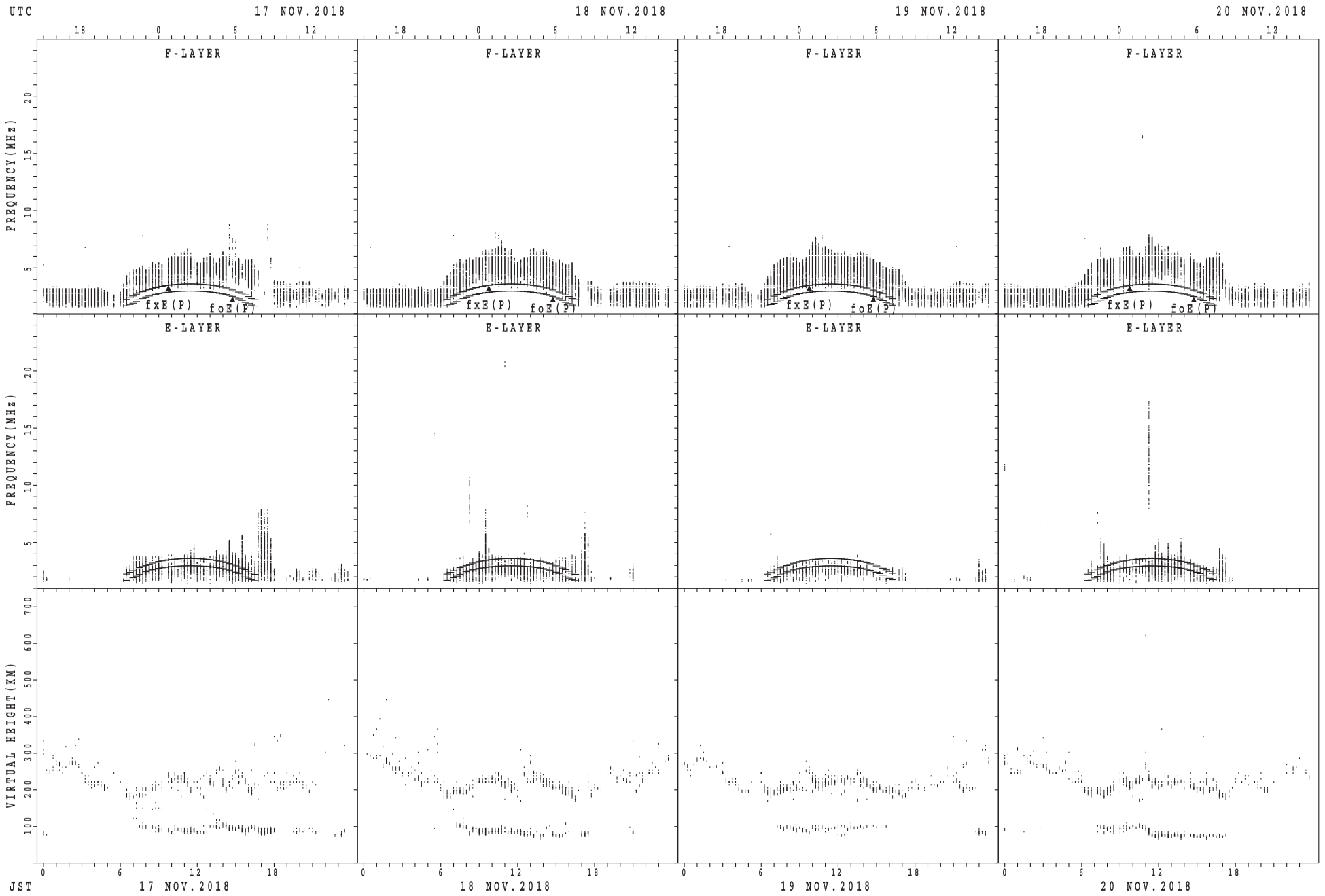

SUMMARY PLOTS AT Kokubunji
UTC
9 NOV.2018
10 NOV.2018
11 NOV.2018
12 NOV.2018
F-LAYER
fxE(P)
foE(P)
E-LAYER
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
JST
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



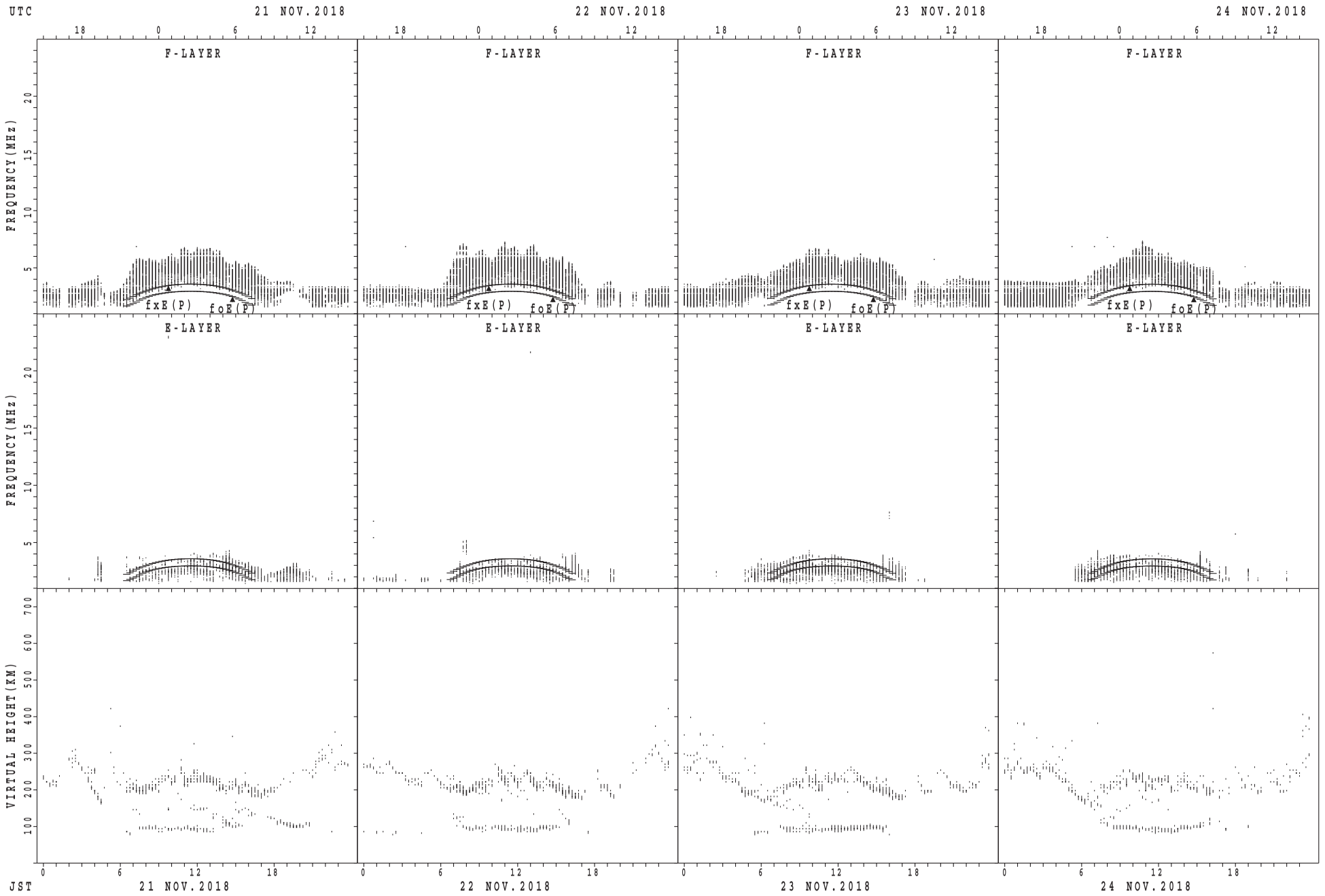
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



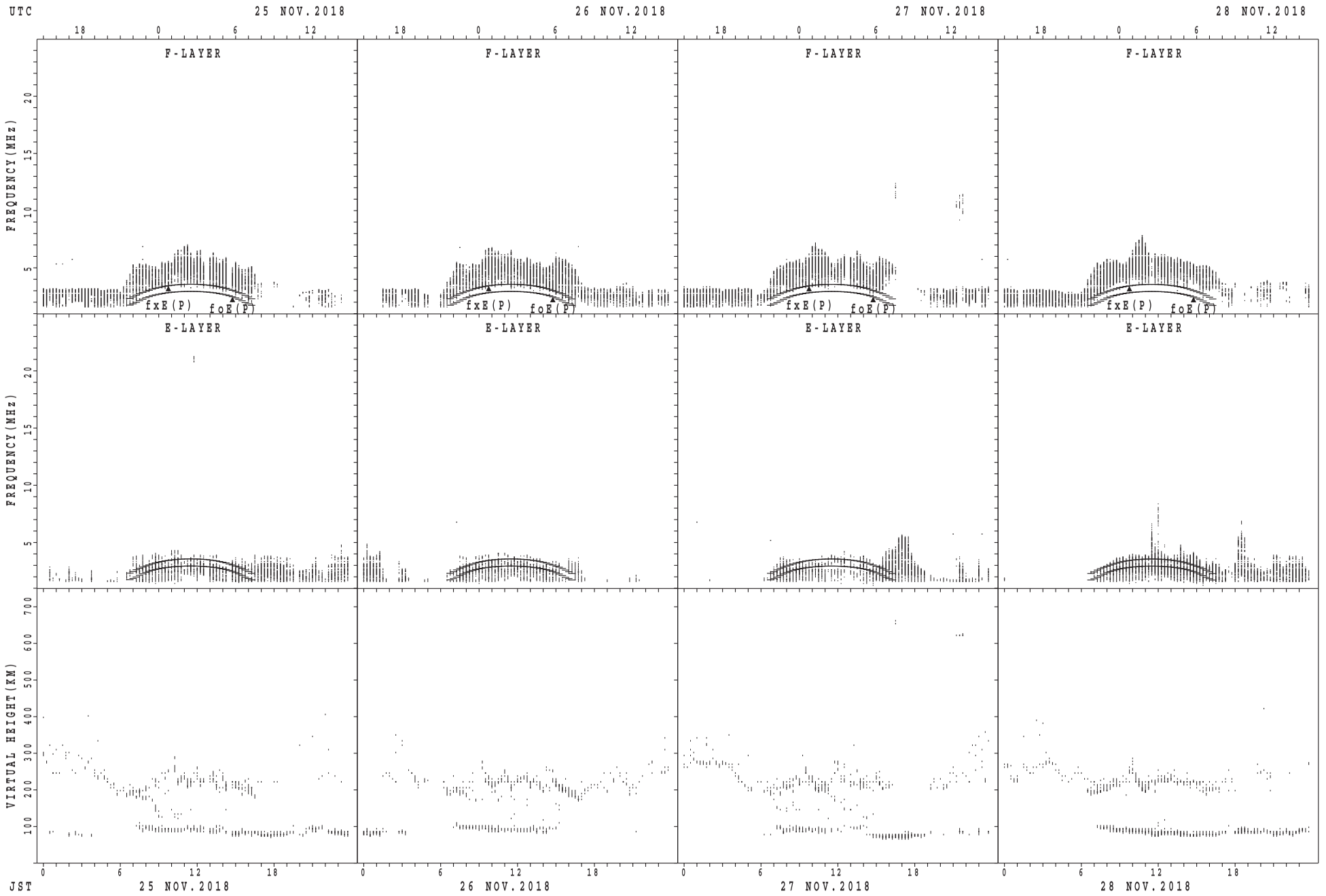
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



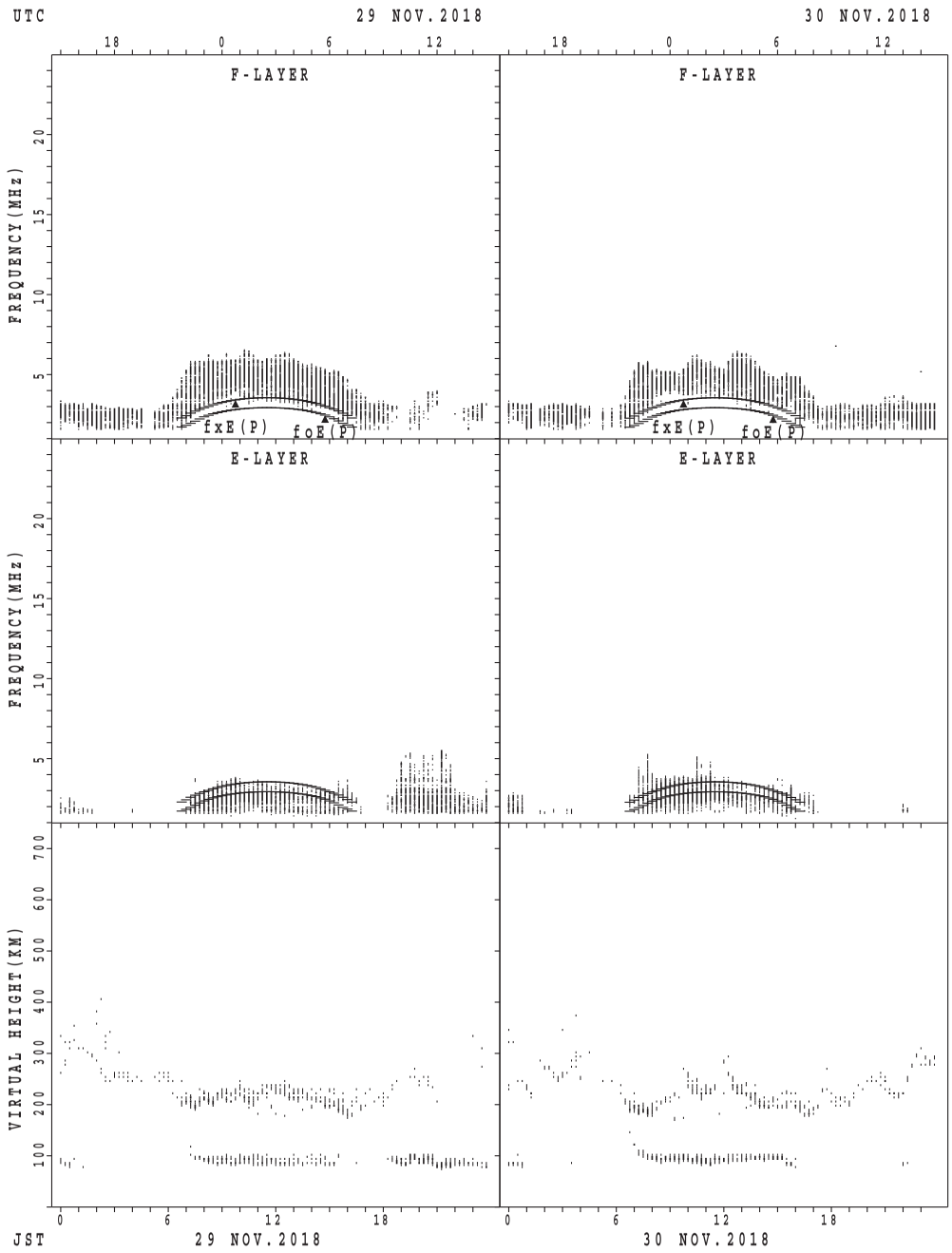
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



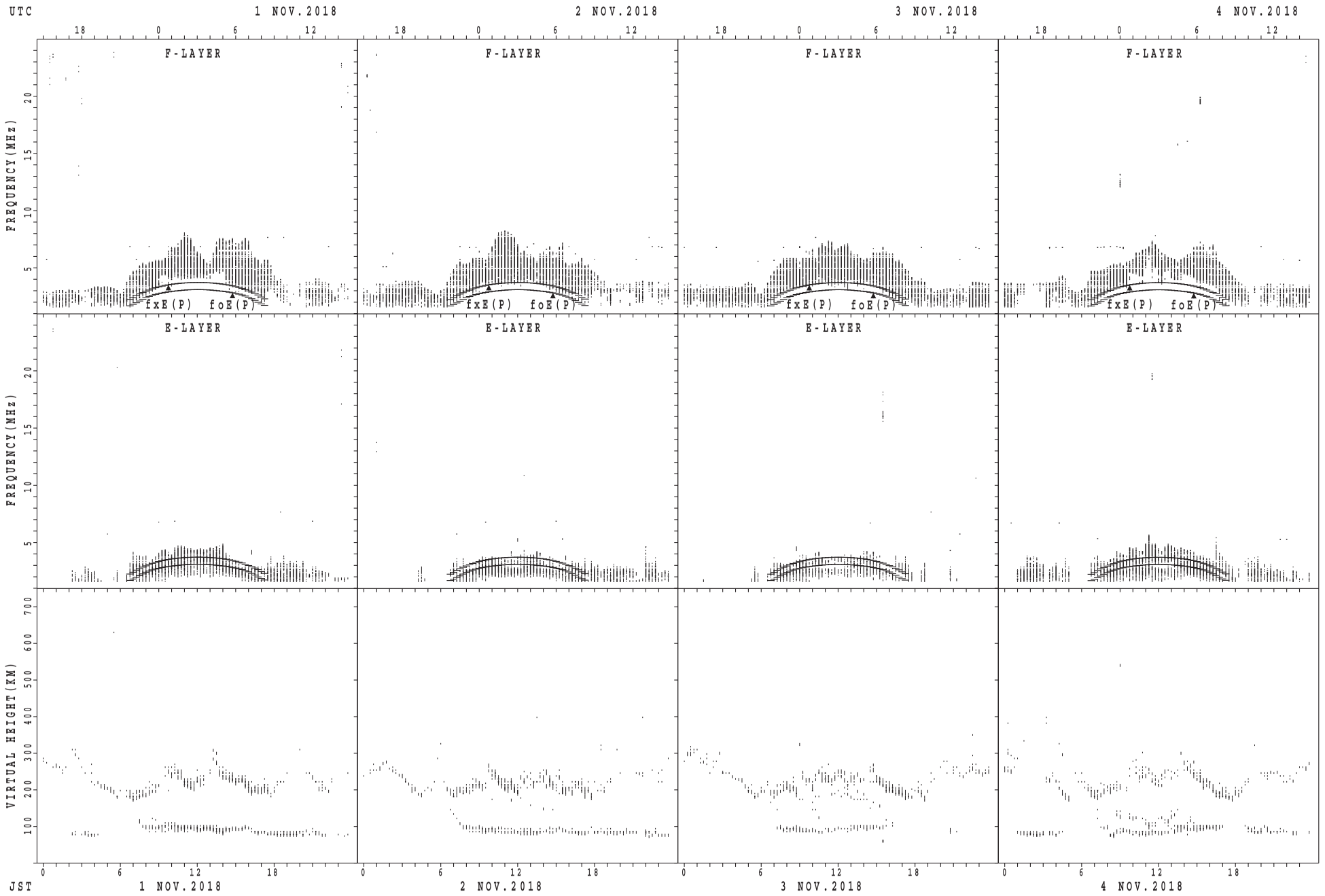
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



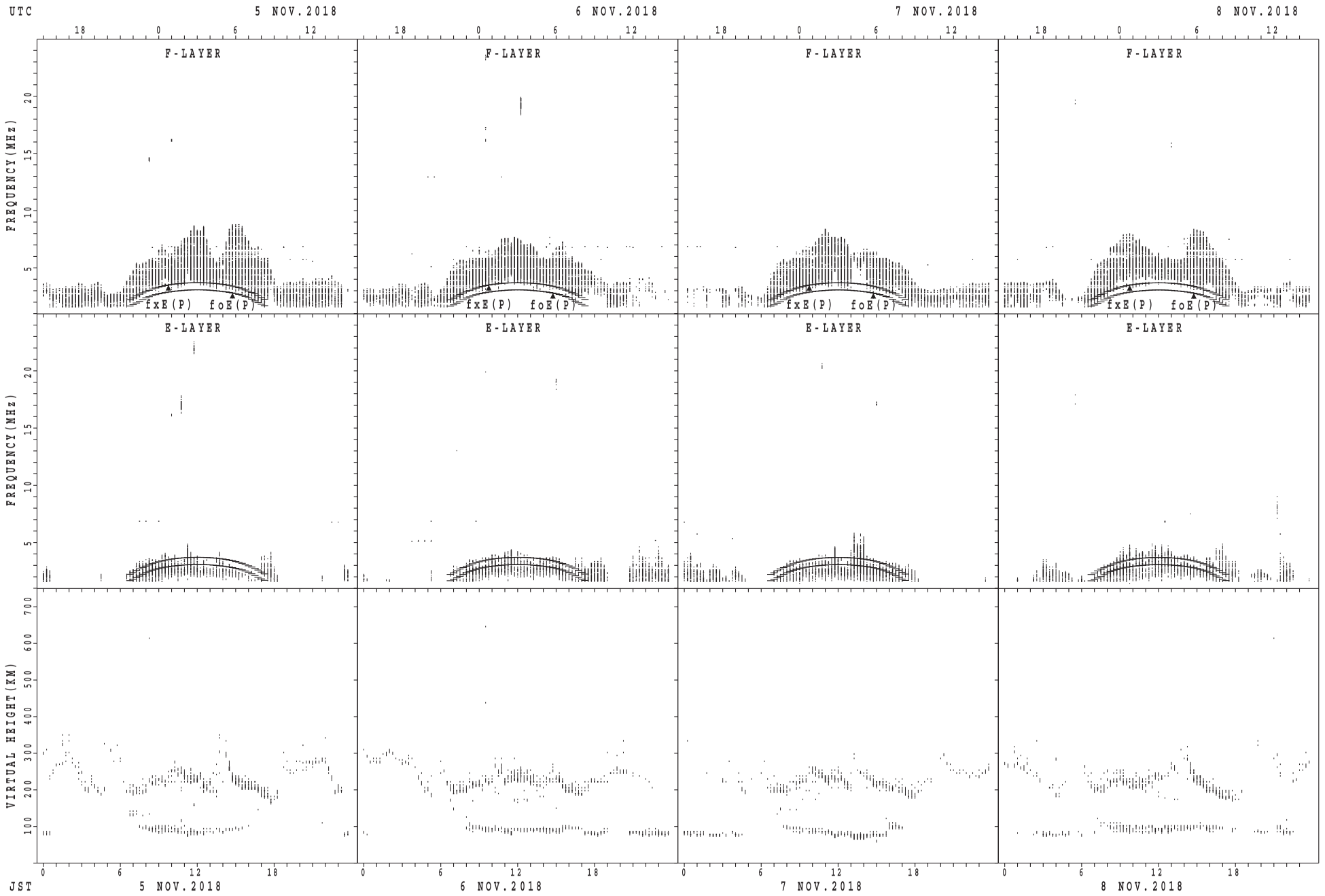
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa

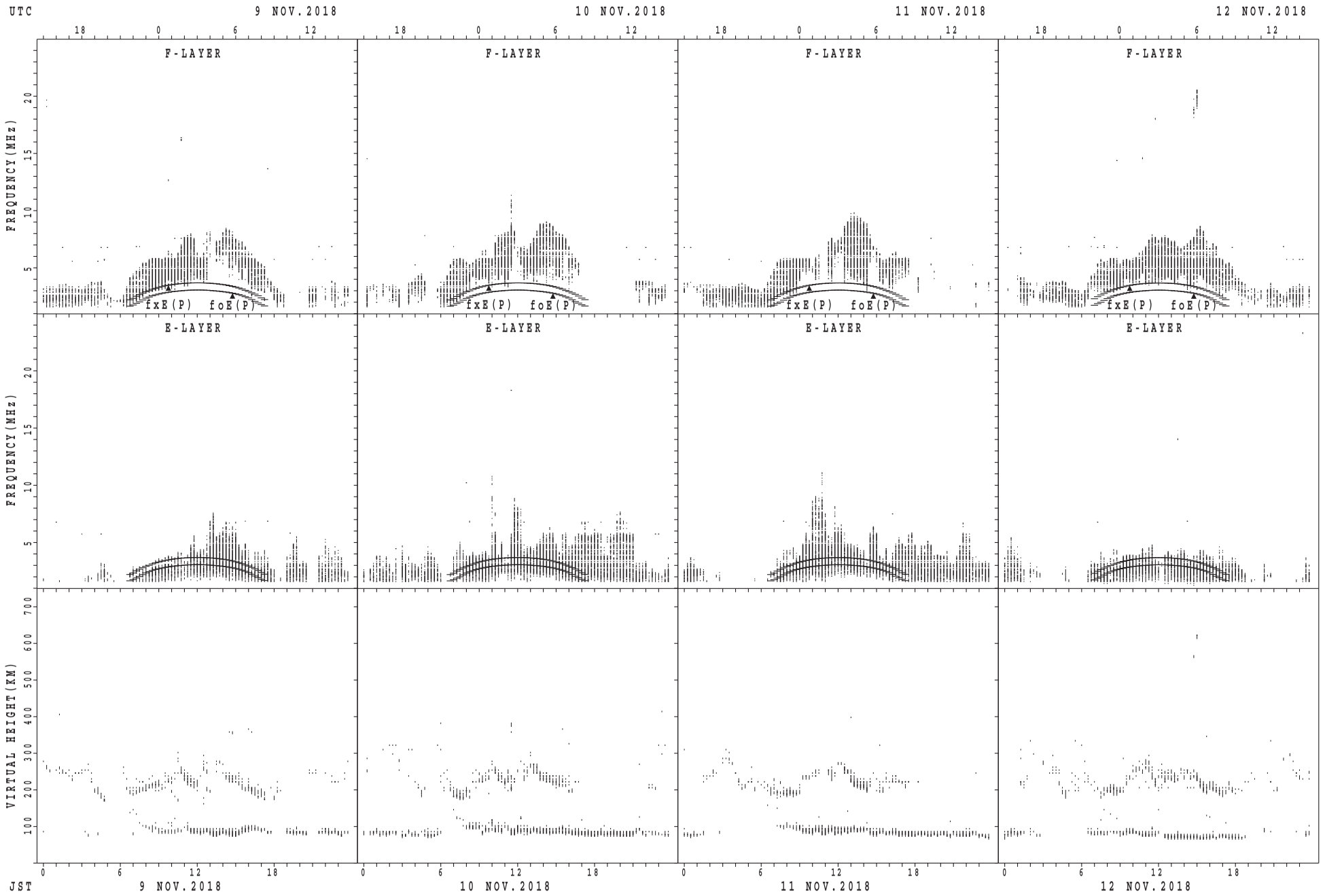


fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

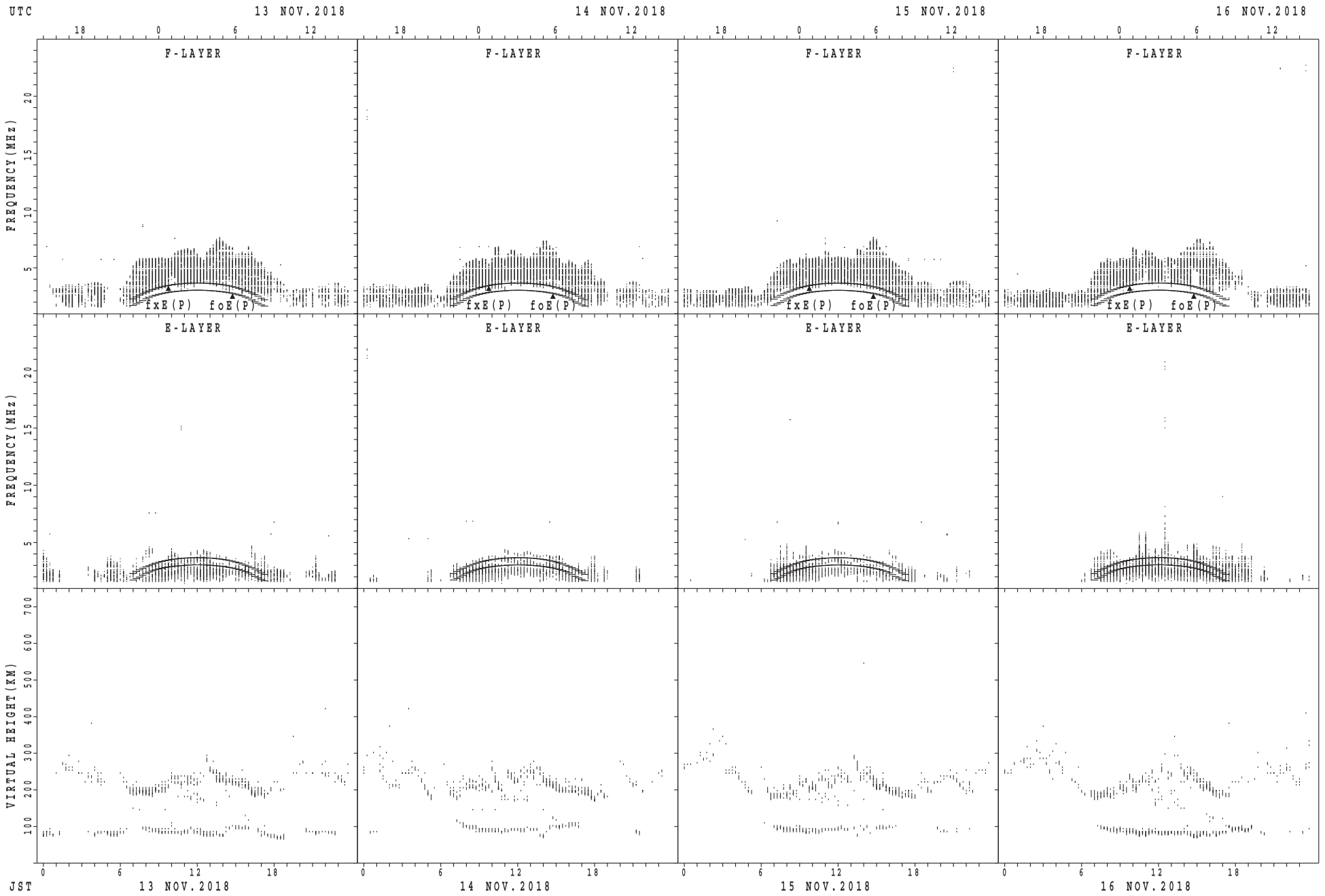
SUMMARY PLOTS AT Yamagawa



fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

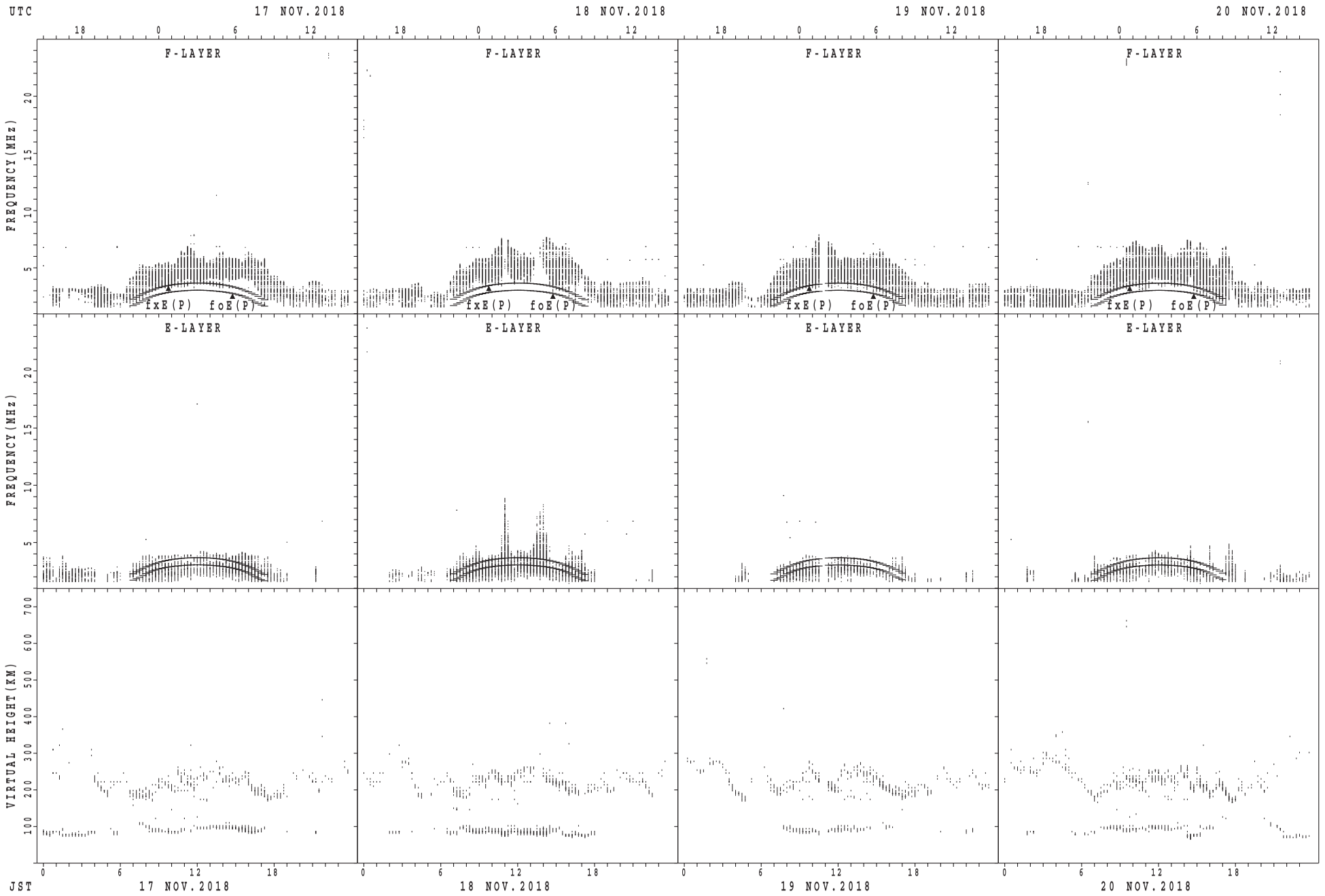

SUMMARY PLOTS AT Yamagawa
UTC
9 NOV.2018
10 NOV.2018
11 NOV.2018
12 NOV.2018
F-LAYER
E-LAYER
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
fxE(P) foE(P)
JST
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



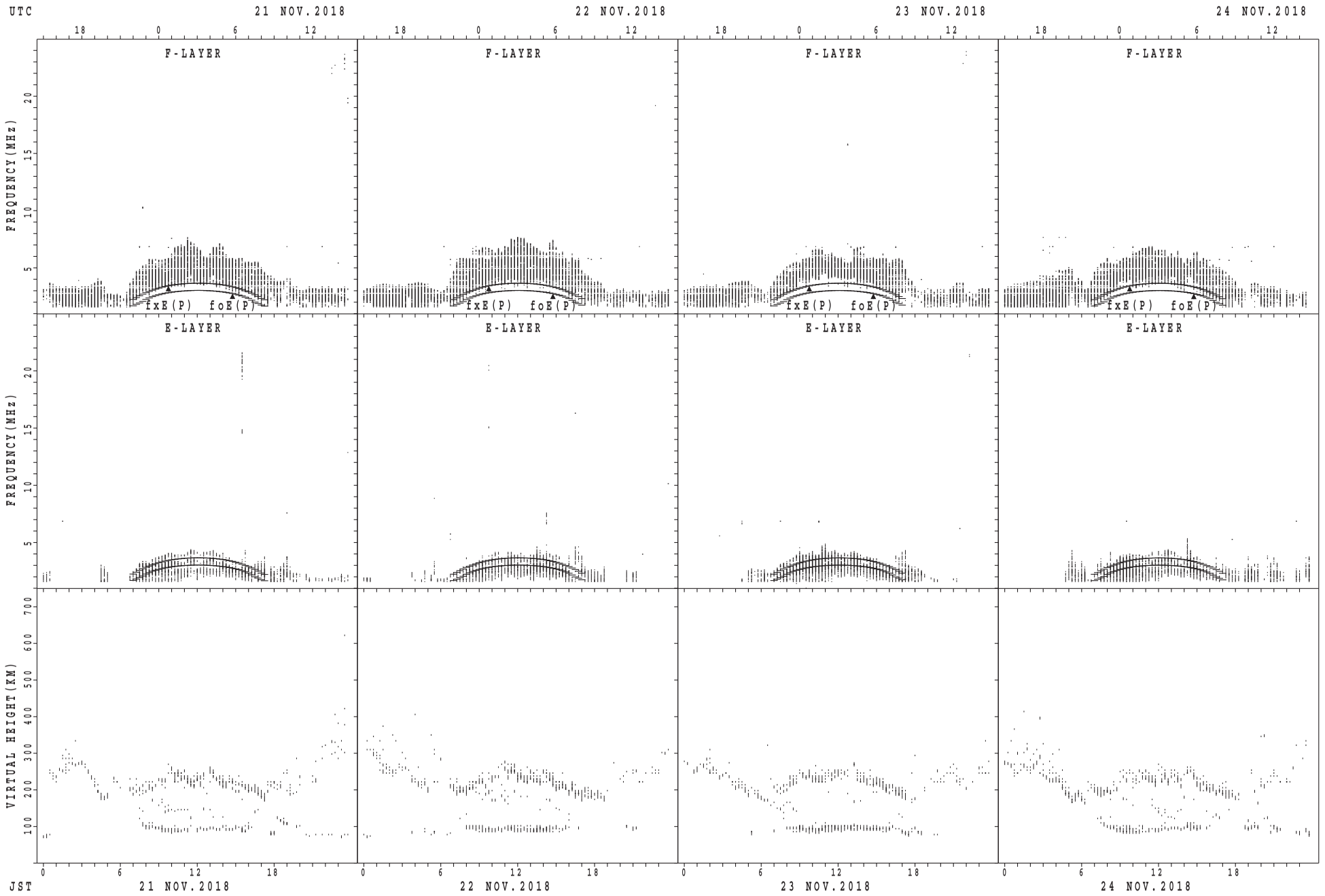
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa

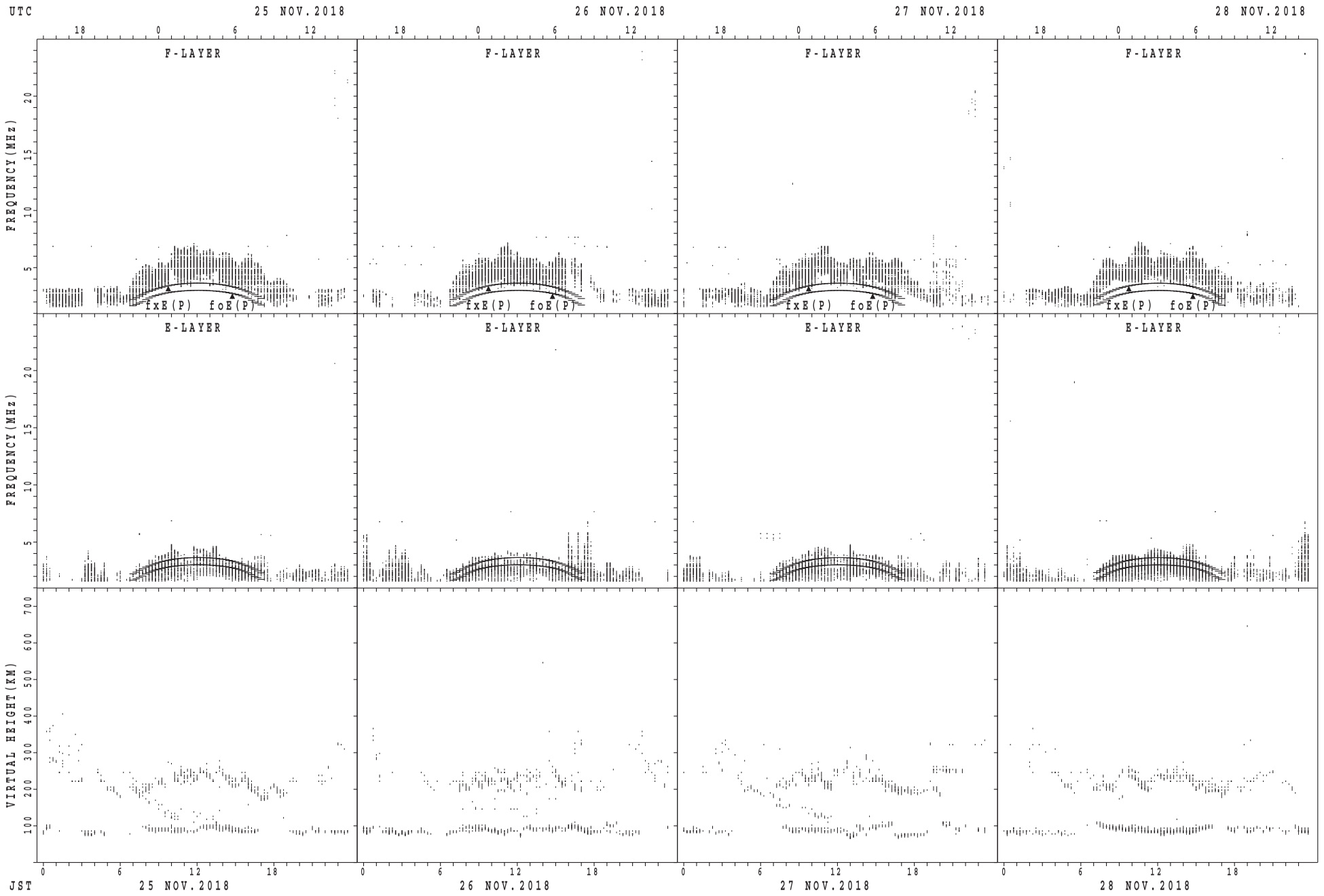


fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

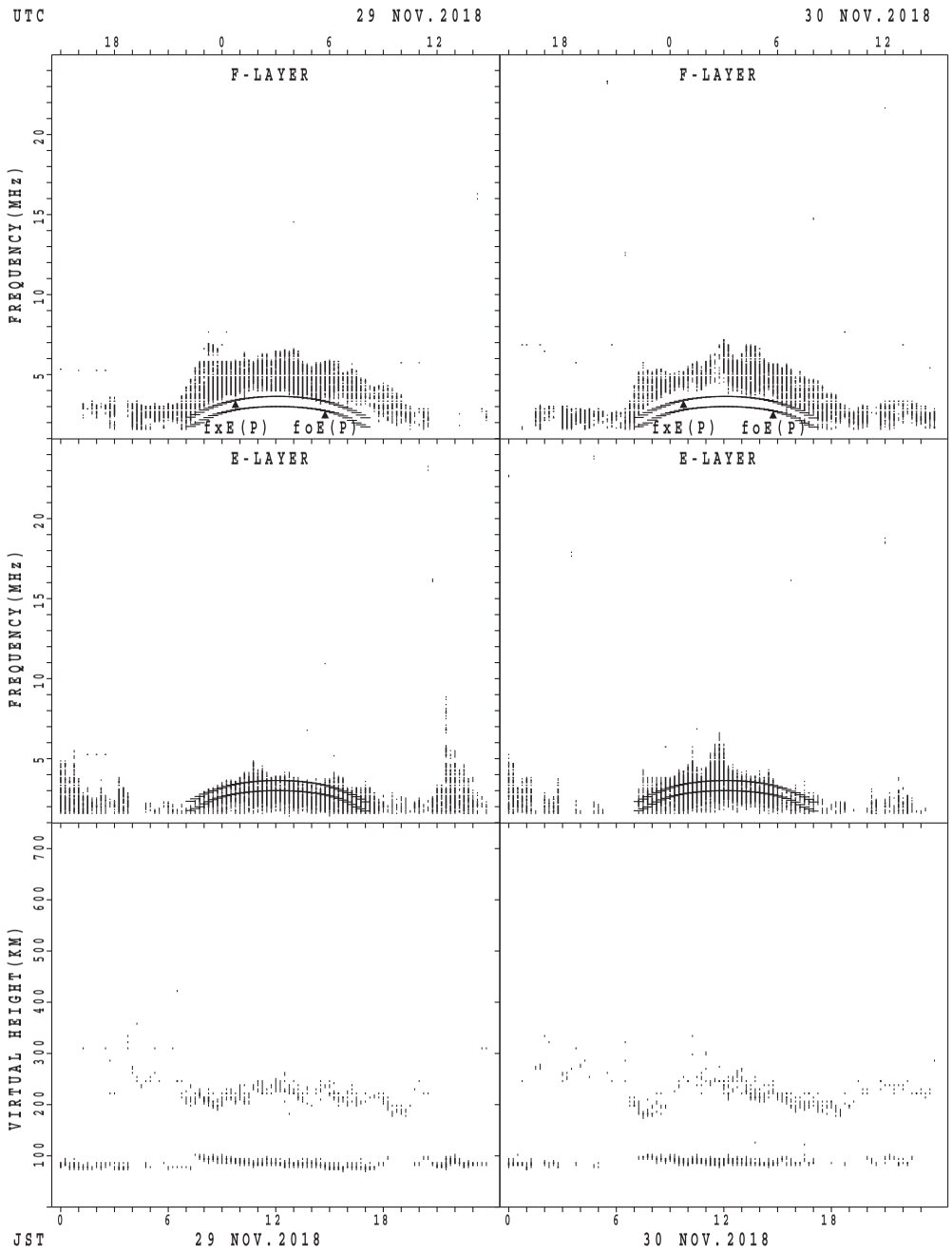
SUMMARY PLOTS AT Yamagawa



fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

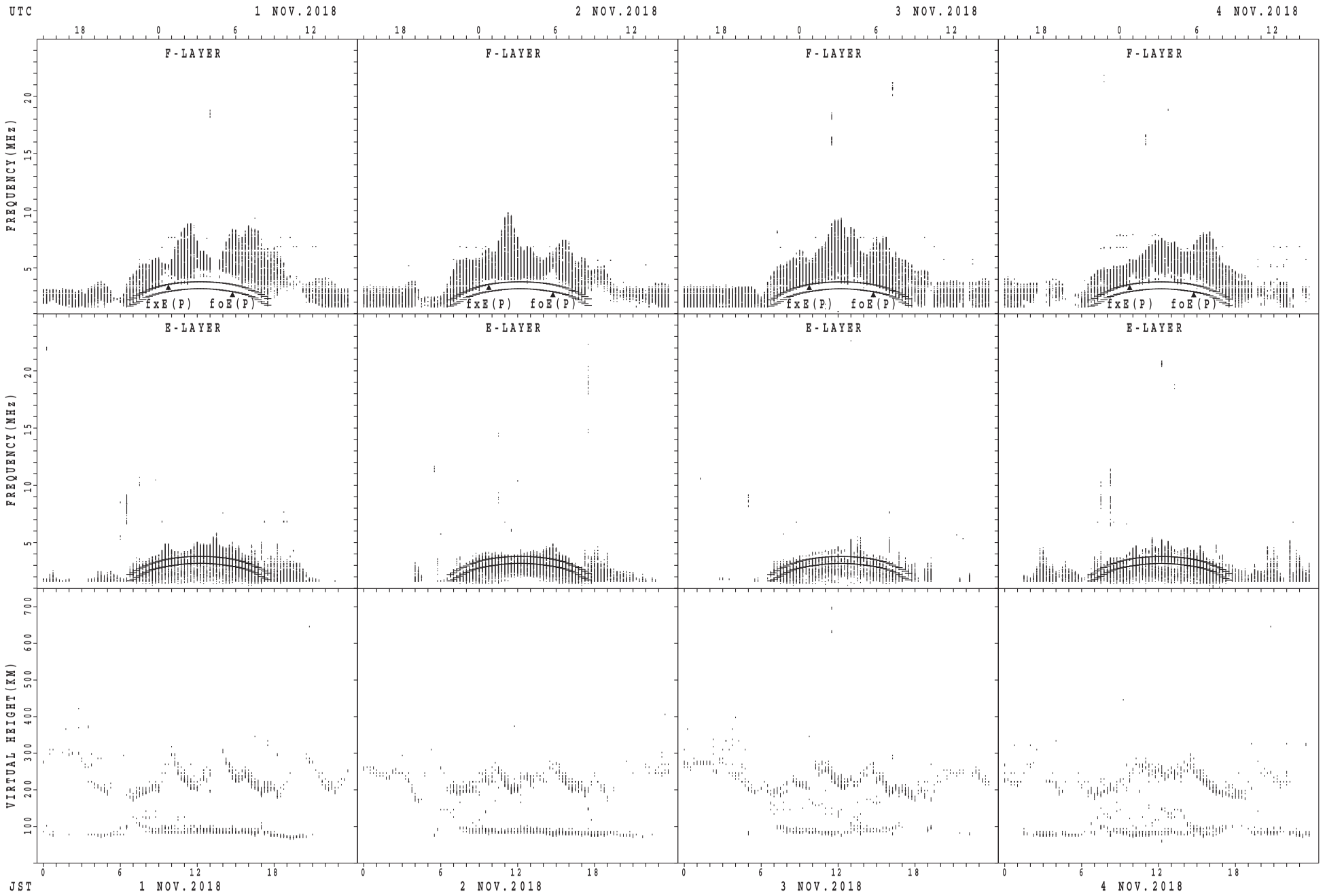


fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE



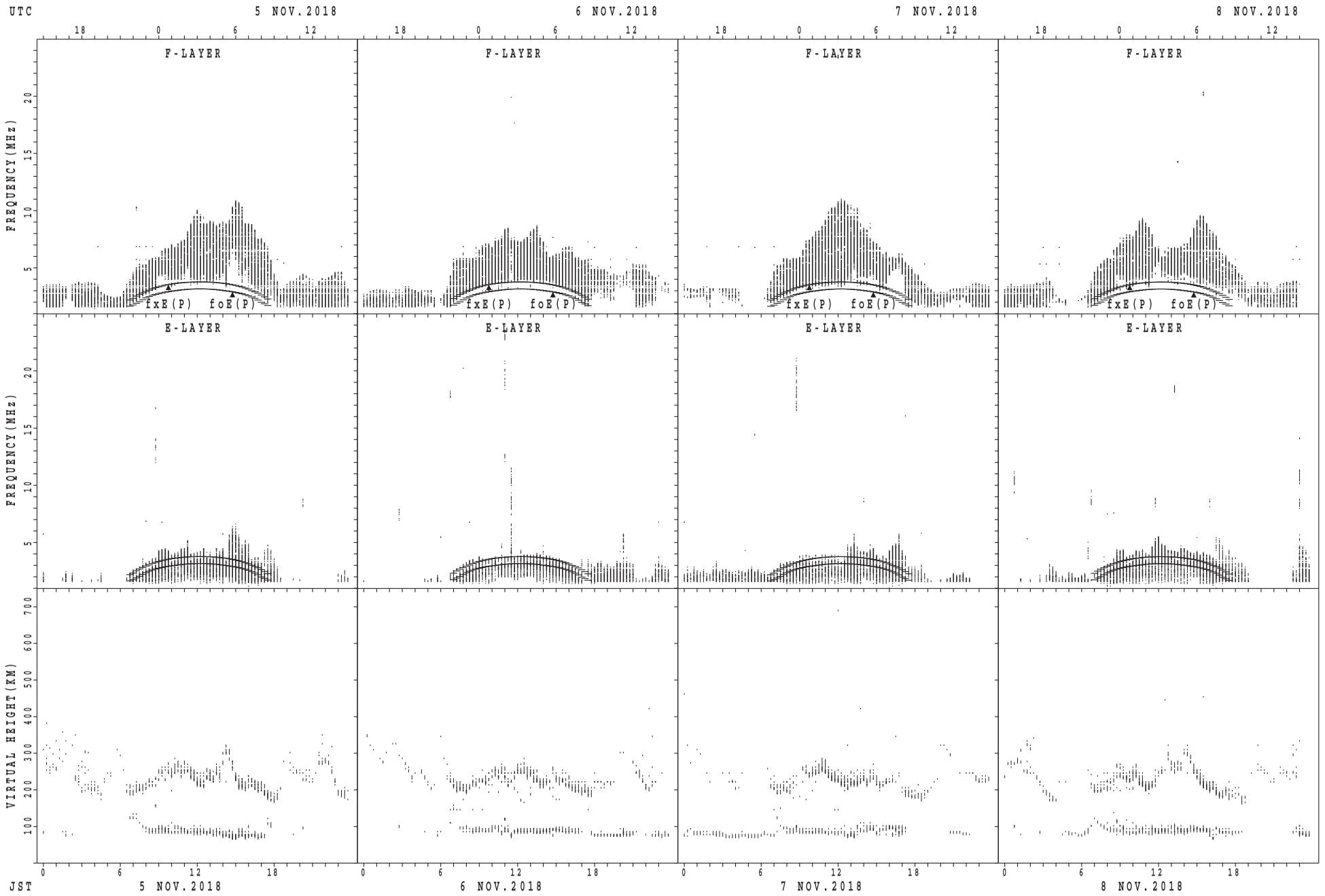
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



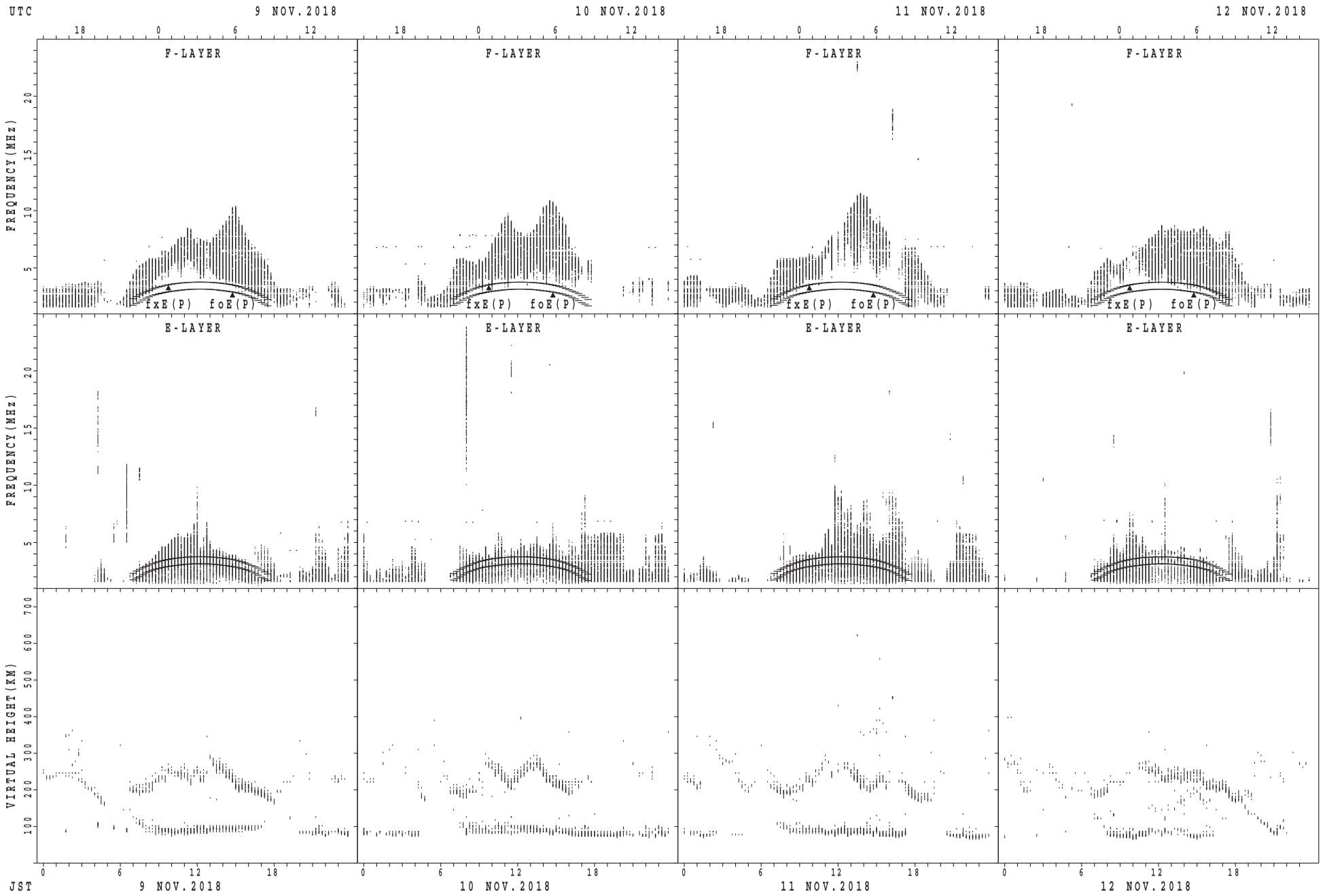
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



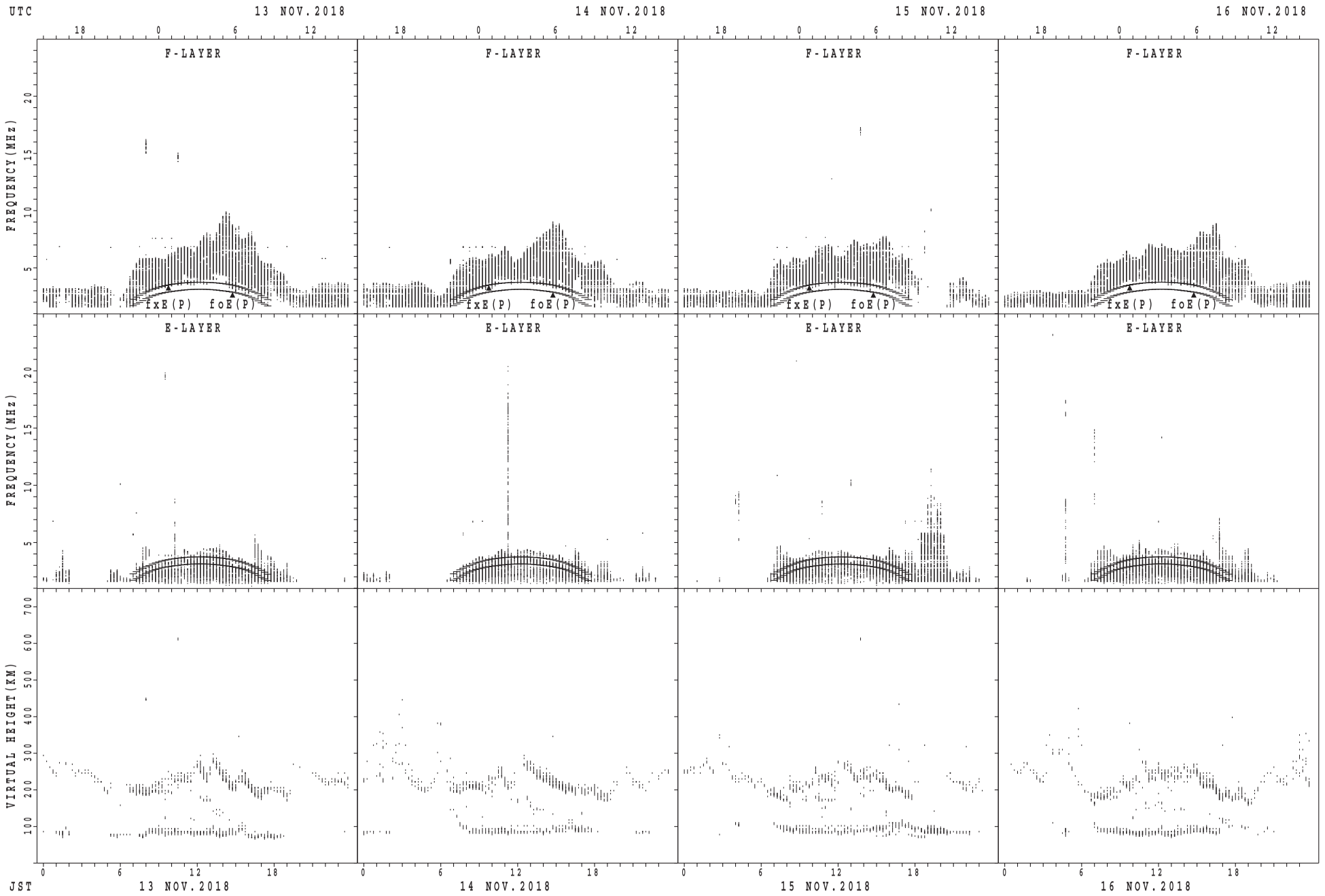
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



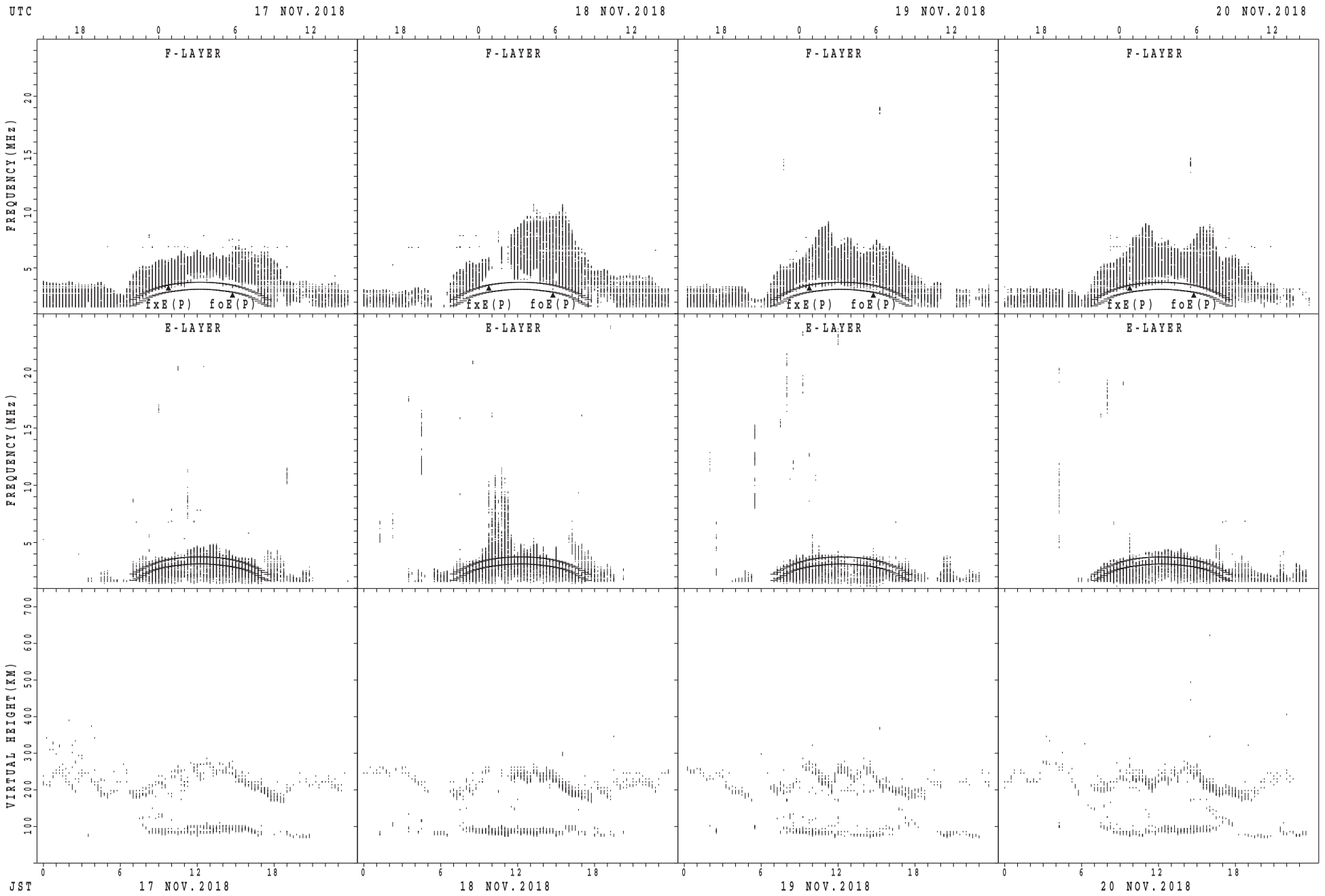
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



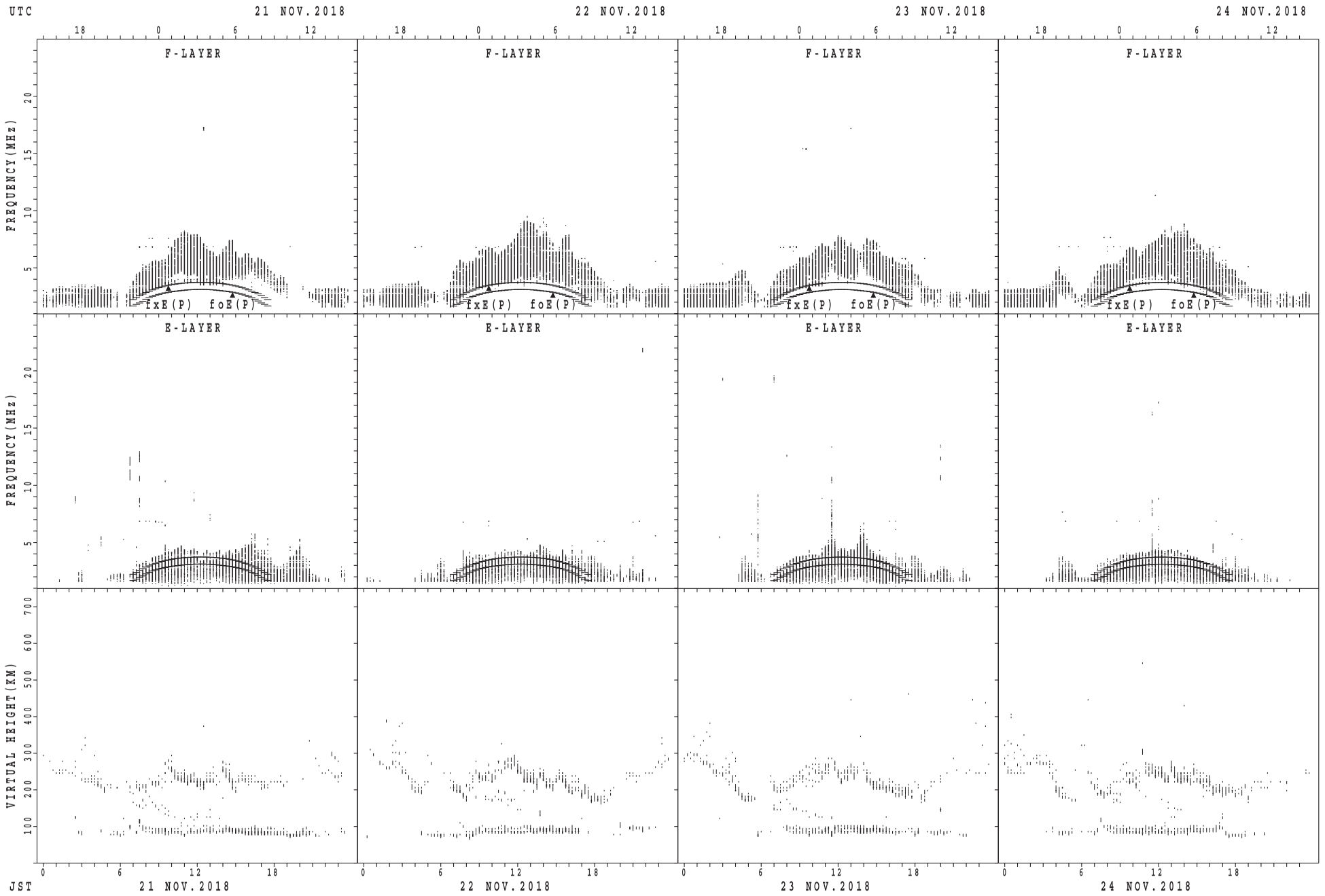
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



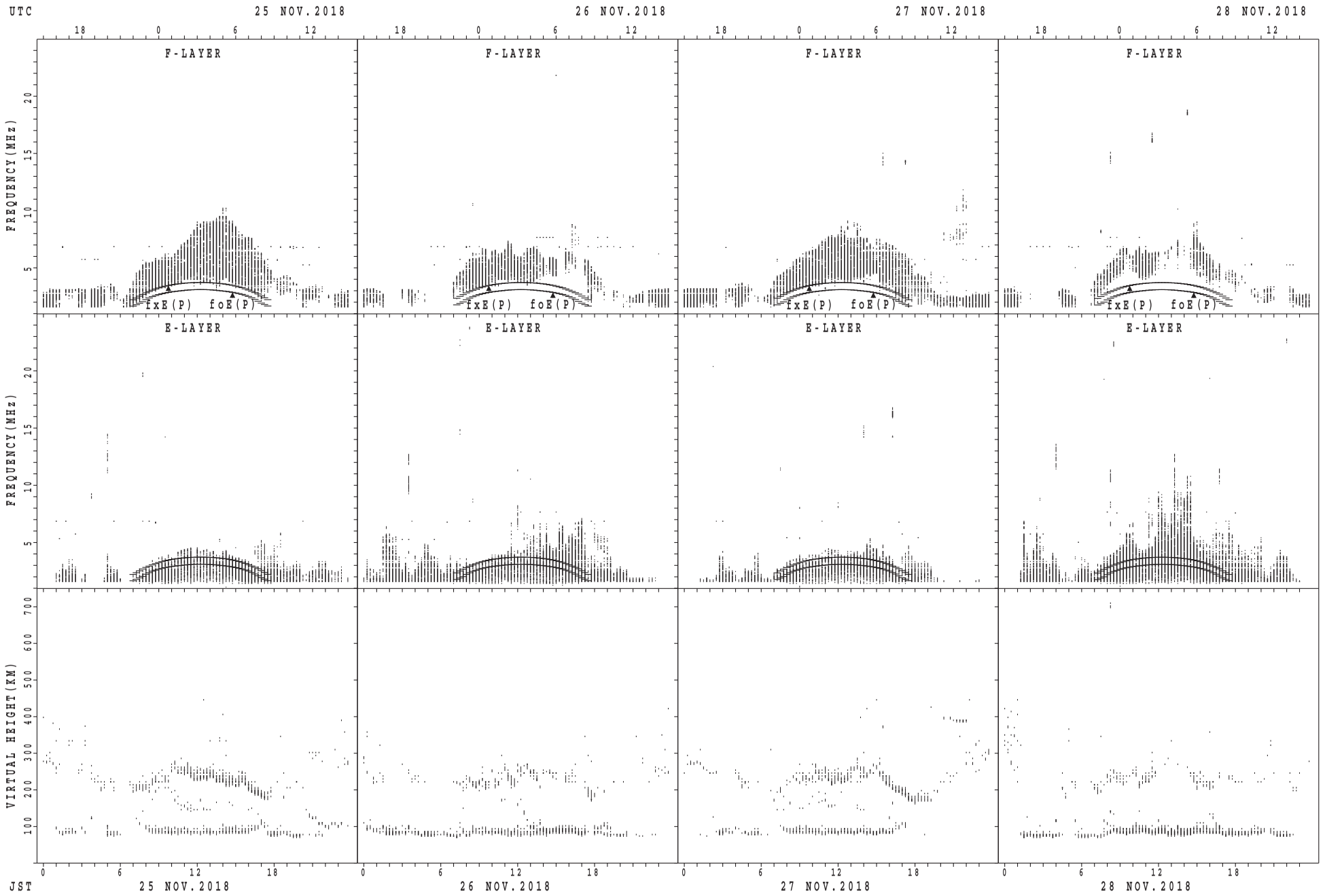
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



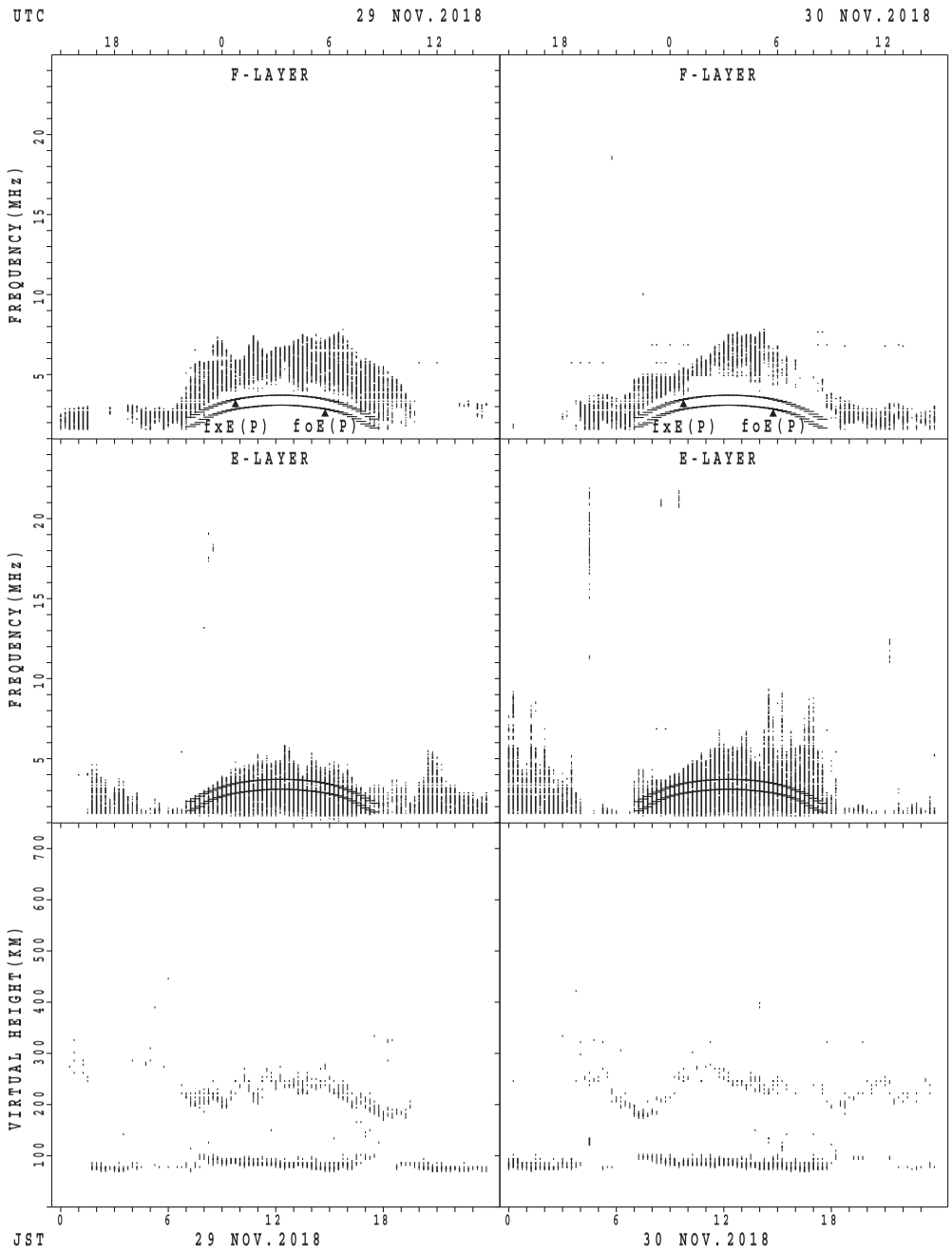
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

MONTHLY MEDIANS OF h'F AND h'Es

NOV.2018 135E MEAN TIME(UTC+9H) AUTOMATIC SCALING

h'F STATION Wakkanai LAT. 45°10.0'N LON. 141°45.0'E

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT									4	6	7	12	14	6	3	2	3	1		1				
MED									221	209	234	221	215	230	224	230	226	216		234				
U Q									232	234	244	240	226	236	232	236	258	108		117				
L Q									204	206	212	215	208	224	210	224	210	108		117				

h'Es

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	12	11	13	11	10	8	3	23	29	28	27	25	25	19	22	22	22	16	13	15	13	15	9	10
MED	88	83	85	81	85	89	179	161	101	94	95	89	91	89	96	81	81	84	81	89	89	89	89	89
U Q	90	89	89	89	115	123	181	169	135	108	119	115	104	95	149	131	89	105	90	95	91	91	89	89
L Q	82	81	81	79	81	86	81	107	94	88	89	83	83	79	85	79	79	81	79	81	84	87	87	83

h'F STATION Kokubunji LAT. 35°43.0'N LON. 139°29.0'E

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								1	3	8	3			4	10	7	2							
MED								202	230	245	232			239	236	226	234							
U Q								101	232	252	232			245	242	234	250							
L Q								101	202	238	228			232	230	214	218							

h'Es

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	8	9	6	5	4	5	7	19	21	23	20	20	18	15	13	23	22	20	11	12	9	8	9	12
MED	87	81	81	85	86	89	177	131	101	95	91	89	91	95	97	95	89	95	91	93	91	86	87	87
U Q	90	84	83	92	91	175	183	167	126	131	96	94	159	143	120	107	105	176	121	101	95	90	93	88
L Q	83	81	81	81	82	82	91	107	95	89	87	89	89	85	80	81	83	80	87	86	88	84	82	82

h'F STATION Yamagawa LAT. 31°12.0'N LON. 130°37.0'E

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT									2	5	5				3	15	8	1						
MED									213	234	226				240	226	215	224						
U Q									216	248	254				240	236	228	112						
L Q									210	230	224				234	218	208	112						

h'Es

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	15	9	12	8	8	6	7	24	20	21	26	18	26	26	22	22	23	21	24	15	11	15	13	10
MED	85	81	85	81	81	84	91	167	110	97	110	96	98	94	94	95	97	91	89	89	87	89	87	84
U Q	89	87	89	82	81	87	183	172	125	113	137	113	145	125	113	103	119	97	136	95	89	91	95	87
L Q	81	81	83	80	81	83	87	120	96	91	89	89	89	85	89	87	89	83	82	83	83	83	82	83

MONTHLY MEDIANS OF h'F AND h'Es

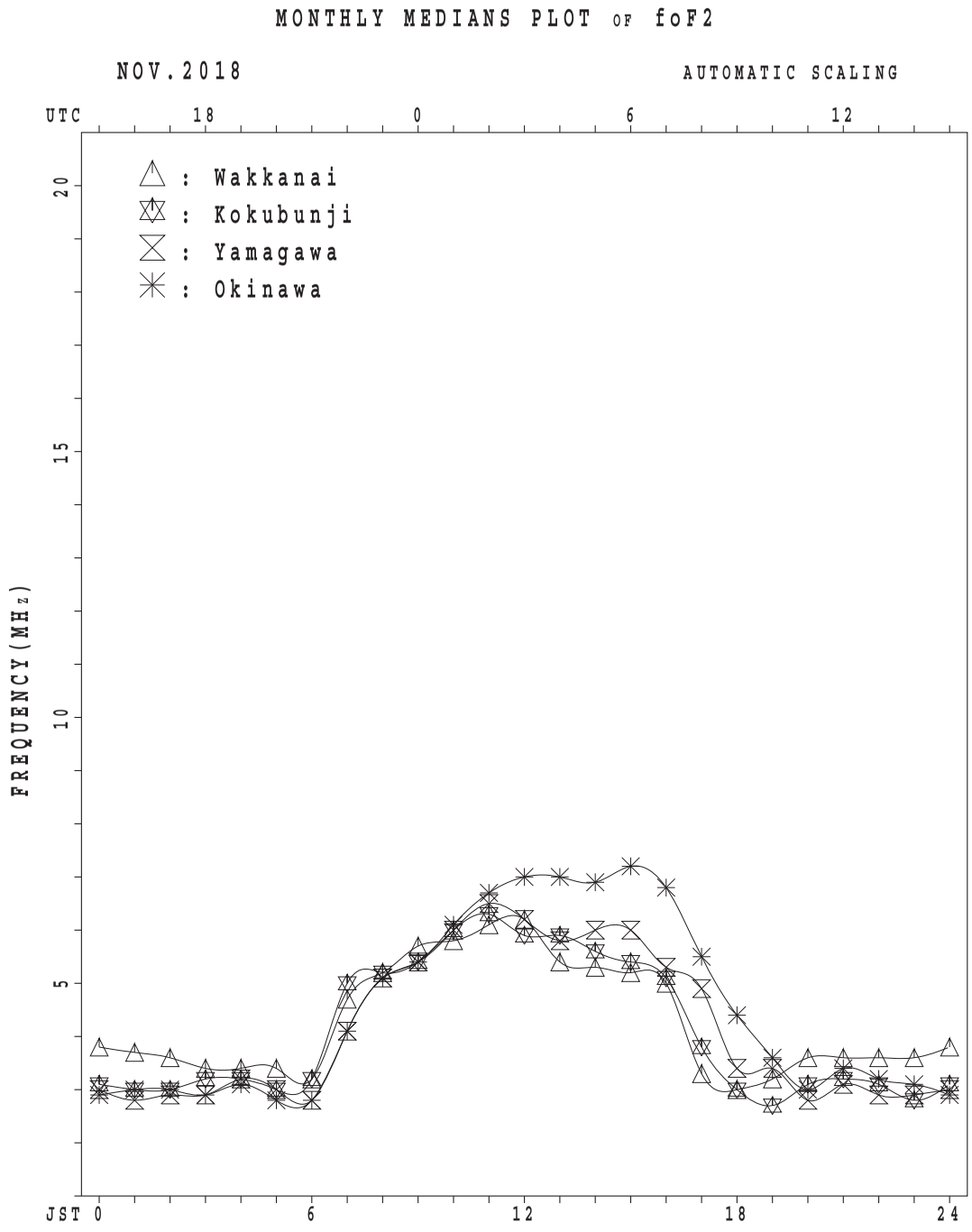
NOV.2018 135E MEAN TIME(UTC+9H) AUTOMATIC SCALING

h'F STATION Okinawa LAT. 26°41.0'N LON. 128°09.0'E

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT									1	4	5					23	24	3						
MED									448	242	242					230	215	212						
U Q									224	258	271					242	230	236						
L Q									224	221	237					216	207	192						

h'Es

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	6	7	10	9	11	10	8	27	21	29	24	27	29	29	28	28	29	26	26	23	17	13	8	10
MED	87	87	83	83	85	83	83	143	125	109	98	95	101	97	95	95	95	94	88	99	83	85	91	80
U Q	89	91	87	87	117	103	84	167	158	149	113	113	146	130	113	98	112	113	111	173	88	93	107	99
L Q	83	81	81	81	81	81	78	111	95	95	90	93	90	90	89	89	88	83	83	81	78	82	81	79


MONTHLY MEDIANS PLOT OF foF2
NOV.2018
AUTOMATIC SCALING
UTC
18
0
6
12
: Wakkanai
: Kokubunji
: Yamagawa
: Okinawa
FREQUENCY(MHz)
20
15
10
5
JST 0
6
12
18
24

IONOSPHERIC DATA STATION Wakkanai

NOV. 2018 fxI (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

LAT.45°10.0'N LON.141°45.0'E SWEEP 1.0MHz TO 30.0MHz IN 15.0SEC IN MANUAL SCALING

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	X 42	44	43	43	43	X 42													X 39	X 43	X 44	45	X 45	X 50
2	X 49	54	55	50	56	56													X 46	X 50	X 55	X 57	X 57	X 54
3	X 51	X 51	X 51	X 51	53	54													X 35	X 39	X 44	X 45	X 46	X 45
4	57	X 44	54	X 45	X 40	39													X 40	X 37	X 37	43	X 39	X 39
5	X 40	X 39	X 37	X 39	X 41	X 37													X 76	X 67	X 59	X 59	X 73	X 55
6	X 61	X 61	X 62	58	55	56													X 30	X 37	X 39	X 39	X 40	X 41
7	X 39	41	X 43	X 39	X 37	X 34													X 36	X 38	X 42	X 42	X 45	X 45
8	X 41	X 45	X 46	X 41	X 40	X 37													X 30	X 39	X 46	X 40	X 40	X 40
9	X 43	X 45	X 46	X 43	X 43	46	42												X 38	X 41	X 46	X 42	X 46	X 48
10	58	52	48	48	48	X 38													X 45	X 52	X 55	X 53	X 51	X 53
11	X 55	X 55	X 56	58	57	57	54												X 36	X 41	X 45	X 44	X 44	58
12		58	X 38	38	38	37	39												X 35	X 35	X 33	X 37	X 35	X 39
13	X 37	X 40	X 41	X 37	38	X 38													A	A	X 38	X 41	X 39	47
14	54	53	42	X 39	X 37	X 37													X 33	X 37	X 37	X 39	X 43	X 40
15	46	X 39	X 39	X 37	X 35	X 35													X 35	X 35	X 37	X 39	X 39	X 39
16	X 38	X 41	X 42	X 39	X 37	X 34													X 31	X 36	X 35	X 35	X 34	X 36
17	X 37	X 36	X 35	X 34	X 35	X 35													X 36	X 39	X 41	X 38	X 37	X 41
18	X 39	X 39	X 36	39	X 32	39	32												X 30	X 34	X 34	X 35	X 38	X 38
19	X 37	X 38	X 39	38	40	X 38	35												X 33	X 33	X 38	X 40	X 40	X 42
20	X 39	X 40	X 40	X 39	X 38	X 39													X 43	X 45	X 39	X 39	44	53
21	56	56	56	54	X 45	49													X 39	X 41	X 41	X 42	X 42	X 45
22	44	48	44	44	X 39	X 41													X 40	X 43	53	X 44		58
23	58	58	58	56	56	48													X 33	X 35	47	44	X 39	X 41
24	37	X 39	38	36	X 33	30													X 32	X 37	X 41	X 39	55	55
25	47	48	48	48	58	54	54												X 30	X 32	X 34	X 30	X 34	X 37
26	X 35	X 35	X 35	X 36	X 33	X 30													X 31	X 36	X 39	X 38	X 39	56
27	X 45	X 44	X 48	59	54	X 39	35												X 30	X 31	39	X 38	X 37	X 39
28	X 33	X 33	X 34	37	X 33	X 33													X 34	X 40	X 44	X 44	X 44	X 45
29	X 39	X 40	38	40	X 41	X 43													X 31	X 40	X 47	X 39	X 41	X 40
30	X 39	X 37	X 35	39	38	36													X 33	X 34	X 40	X 42	X 39	X 39
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	30	30	30	30	30	7												29	29	30	30	29	30
MED	X 42	X 44	X 42	40	X 40	X 38	39												X 35	X 38	X 41	X 40	X 40	X 44
U Q	52	52	48	48	48	46	54												X 39	X 41	X 46	X 44	X 45	53
L Q	X 38	X 39	X 38	38	X 37	X 36	35												X 31	X 35	X 38	X 39	X 39	X 39

NOV. 2018 fxI (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

NOV. 2018 foF2 (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

LAT.45°10.0'N LON.141°45.0'E SWEEP 1.0MHz TO 30.0MHz IN 15.0SEC IN MANUAL SCALING

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	35	F 31	F 31	F 31	F 31	35	33	51	56	56	62	66	67	70	61	56	57	38	32	36	37	F 34	38	43
2	42	F 38	F 38	F 36	F 44	F 37	32	47	52	56	53	52	70	56	53	54	49	41	39	43	48	50	50	47
3	44	44	44	44	F 41	F 44	39	46	56	48	56	63	60	50	50	54	52	41	28	32	37	38	39	38
4	F 47	37	F 38	38	33	F 28	28	41	47	59	58	59	59	V 53	53	46	46	32	33	30	30	F 32	32	32
5	33	32	30	32	34	30	33	52	56	58	80	95	V 69	68	72	A	65	72	69	60	52	52	66	48
6	54	54	55	F 47	F 37	F 33	32	41	50	50	54	55	56	48	49	48	43	37	23	30	32	32	33	34
7	32	F 32	36	32	30	27	30	50	52	48	52	56	62	V 55	52	50	42	32	29	31	35	35	38	38
8	34	38	39	34	33	30	27	47	51	52	51	63	60	55	59	52	53	30	R 23	32	39	33	33	33
9	36	38	39	36	36	F 34	F 32	46	46	53	58	62	68	59	54	56	46	32	31	34	39	35	39	41
10	F 38	F 39	F 35	F 33	F 31	31	26	43	58	51	59	69	68	60	58	58	63	40	38	45	48	46	44	46
11	48	48	49	F 46	F 41	F 35	F 37	45	49	49	58	58	75	56	53	54	56	38	29	34	38	37	37	F 48
12	F 38	F 33	31	F 26	F 26	F 24	F 24	44	46	56	58	56	63	54	58	56	58	37	28	28	26	30	28	32
13	31	33	34	30	F 29	31	22	41	55	63	59	69	55	53	47	55	58	A	A	A	31	34	32	F 32
14	F 33	F 32	F 32	32	30	30	25	42	50	47	52	73	63	56	44	58	50	V 29	26	30	30	32	36	33
15	F 33	32	32	30	28	28	21	41	47	52	56	57	62	51	49	52	50	28	28	28	30	32	32	32
16	31	34	35	32	30	27	22	41	48	54	53	59	56	52	52	49	54	31	24	29	28	28	27	29
17	30	29	28	27	28	28	23	37	47	52	54	62	54	49	55	54	46	41	29	32	34	31	30	34
18	32	32	29	F 25	25	F 23	F 20	44	50	57	59	52	59	57	47	52	44	34	22	27	27	28	31	31
19	30	31	32	F 27	F 27	31	F 24	43	52	58	57	57	67	60	52	52	42	29	26	26	31	33	33	35
20	32	33	33	32	31	32	26	42	55	59	67	65	61	56	58	52	50	34	36	38	32	32	F 32	F 33
21	F 32	F 35	F 36	F 40	38	F 36	30	43	52	57	56	65	65	53	56	49	50	33	32	34	34	35	35	38
22	F 32	F 32	F 32	F 32	32	34	34	51	59	67	55	71	60	52	50	48	40	28	33	36	F 39	37	F 37	F 44
23	F 31	F 29	F 46	F 41	F 38	F 32	36	48	52	54	51	58	58	53	49	49	45	27	26	28	F 36	F 32	32	34
24	F 24	32	F 27	F 25	26	F 21	20	42	55	56	50	59	54	48	45	44	35	26	25	30	34	32	F 37	F 43
25	F 33	F 40	F 32	F 31	F 31	F 31	F 31	43	48	58	54	59	56	49	45	48	40	25	23	25	27	23	27	29
26	28	28	28	29	26	23	20	37	51	50	54	60	50	49	46	50	39	27	24	29	32	31	32	F 38
27	38	F 37	F 37	F 37	F 26	32	F 23	41	50	50	49	55	52	52	49	48	38	23	23	24	F 30	31	30	32
28	26	26	27	F 26	26	26	27	40	48	58	58	62	61	52	51	48	37	A	27	33	37	37	37	38
29	32	33	F 24	F 25	34	36	34	45	55	59	55	67	58	51	50	47	40	26	24	33	40	32	34	33
30	32	30	28	F 27	F 27	F 24	27	44	46	50	57	55	53	50	50	50	45	26	26	27	33	35	32	32
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	29	30	28	29	29	30	30	30	30
MED	32	33	32	F 32	31	31	27	43	51	55	56	60	60	53	52	52	46	32	28	31	34	32	33	34
U Q	38	38	38	F 36	F 34	F 34	32	46	55	58	58	65	65	56	55	54	53	38	32	34	38	35	37	41
L Q	31	32	30	F 27	27	27	23	41	48	50	53	57	56	51	49	48	42	28	24	28	30	32	32	32

NOV. 2018 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

NOV. 2018 foF1 (0.01MHz) 135°E MEAN TIME (G.M.T. + 9 H)

LAT.45°10.0'N LON.141°45.0'E SWEEP 1.0MHz TO 30.0MHz IN 15.0SEC IN MANUAL SCALING

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1										L	L			L	L	L								
2									A	L	L	L	L	L	L			L						
3									L	L	L	L	L	L										
4								L		L	L	L	L	L	L									
5											L		L	L	L	A								
6							L		L	356	L	384	L		L	L								
7										A	L		L	L	L	L								
8									L	L	L		L	L	L	L								
9								L	L		L	L	L		L									
10												L	392	272	348									
11									L	L	L	L	L	L										
12								L	L	L	L	L	L	L	L									
13										L	L	L	L	A	A	A	A	A						
14											L		L		L									
15										L	L	L	L											
16										L	L	L	L	L										
17									L		L	L	L											
18											L	L	L	L										
19										L	L	L	L	L										
20										L		L	L	L	L									
21										L		L	L	L	L									
22										L	L	L												
23											L	L	L	L	L									
24										L	L	L	L	248										
25										L	L	L	L	L										
26										A	L	L	L	L										
27										L		L	L	L										
28											L	L	L	L	L			A						
29										L	L	L	L	L	L									
30										L	L	L	L	L	L									
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT										1		1	1	2	1									
MED										356		384	392	260	348									
U Q																								
L Q																								

NOV. 2018 foF1 (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

NOV. 2018 foE (0.01MHz) 135°E MEAN TIME (G.M.T. + 9 H)

LAT.45°10.0'N LON.141°45.0'E SWEEP 1.0MHz TO 30.0MHz IN 15.0SEC IN MANUAL SCALING

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1							B	168	232	264	276	272	248	280	244	220	164	192						
2							B	180	264	264	280	296	280	272	244	228	A	B						
3							B	172	256	256	312	388	316	260	276	A	A	A						
4							B	B	232	252	264	252	272	268	252	A	A	252						
5							236	192	244	256	284	260	248	244	216	A	A	A						
6							B	208	252	252	240	256	248	256	244	200	248	A						
7							B	184	208	240	216	248	164	244	228	A	A	A						
8							B	168	232	232	244	244	A	A	252	232	172	B						
9							B	176	200	256	252	228	A	A	A	A	A	A						
10							B	196	216	248	248	236	A	A	A	A	B	A						
11							B	188	212	244	228	268	272	244	244	A	188	196						
12							B	184	212	228	252	272	272	240	236	188	A	A						
13							B	196	U A 204	252	A	A	A	A	A	A	A	A						
14							B	200	216	248	A	A	276	248	224	236	A	A						
15							B	180	236	268	272	272	272	256	236	176	B	B						
16							B	184	244	244	256	276	276	264	240	188	B	B						
17							B	172	208	252	264	276	276	276	236	208	A	B						
18							B	176	236	256	280	288	264	272	232	A	A	A						
19							A	164	212	256	280	280	276	264	A	A	A	B						
20							B	192	208	244	260	272	276	260	232	A	A	B						
21							B	172	232	236	272	276	288	252	R 228	204	A	A						
22							B	232	A	268	268	268	288	A	A	A	A	A						
23							B	B	192	256	260	272	256	256	240	196	A	204						
24							B	B	A	252	264	A	A	264	248	184	B	B						
25							B	B	A	A	A	A	A	248	228	184	B	B						
26							B	A	220	A	A	292	A	260	A	A	A	A						
27							B	B	A	240	A	264	280	244	228	200	B	B						
28							B	A	A	A	A	272	272	252	220	220	A	A						
29							B	188	188	256	264	272	260	A	220	188	A	B						
30							A	192	212	236	248	276	272	240	228	A	A	B						
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							1	23	25	27	24	26	23	24	24	16	4	4						
MED							236	184	216	252	264	272	272	256	236	200	180	200						
U Q								192	236	256	274	276	276	264	244	220	218	228						
L Q								172	208	244	250	260	260	246	228	188	168	194						

NOV. 2018 foE (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

NOV. 2018 foEs (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

LAT.45°10.0'N LON.141°45.0'E SWEEP 1.0MHz TO 30.0MHz IN 15.0SEC IN MANUAL SCALING

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	22	E B 16	J A 23	21	25	J A 56	E B 16	J A 34	32	32	J A 43	54	J A 57	38	J A 87	G	G	J A 27	E B 16	J A 119	E B 16	E B 16	E B 16	22
2	33	36	E B 16	28	26	28	28	22	J A 60	33	J A 33	J A 43	34	30	28	J A 24	J A 105	E B 16	E B 16	J A 25	J A 32	27	32	J A 30
3	J A 27	E B 16	J A 84	38	J A 31	J A 25	20	J A 22	31	J A 43	J A 49	J A 64	J A 54	J A 52	56	J A 46	J A 31	J A 20	28	32	J A 38	J A 37	E B 16	E B 16
4	34	E B 16	E B 16	J A 47	34	29	E B 16	22	28	29	33	J A 31	J A 33	J A 33	J A 27	J A 31	J A 44	J A 37	J A 31	29	J A 28	34	J A 21	28
5	J A 27	J A 82	J A 65	J A 27	J A 31	J A 31	J A 50	21	J A 32	J A 42	J A 39	J A 52	J A 51	J A 51	J A 32	J A 91	J A 38	J A 55	J A 51	J A 47	J A 41	J A 23	J A 20	31
6	23	23	J A 48	J A 35	J A 25	E B 16	E B 16	J A 21	35	J A 29	J A 45	J A 60	J A 84	J A 38	34	26	34	J A 45	J A 52	J A 34	J A 31	J A 51	33	24
7	J A 20	21	21	20	E B 16	E B 16	E B 16	22	28	J A 45	J A 32	J A 41	J A 38	29	J A 30	J A 25	J A 23	J A 19	J A 19	J A 19	J A 37	J A 29	J A 25	J A 25
8	24	J A 31	J A 31	J A 25	25	22	E B 16	J A 52	32	28	J A 28	J A 57	J A 30	J A 29	J A 51	J A 23	J A 19	20	J A 31	35	J A 26	22	E B 16	34
9	J A 37	20	J A 24	24	26	19	J A 20	J A 33	24	28	29	J A 39	J A 39	J A 43	J A 34	J A 49	J A 53	J A 64	E B 16	J A 32	J A 60	33	J A 32	23
10	J A 29	J A 25	J A 25	23	E B 16	J A 21	E B 16	J A 26	J A 33	J A 33	J A 47	J A 36	J A 223	J A 44	J A 52	J A 59	J A 31	J A 21	J A 27	J A 28	J A 23	28	J A 30	J A 65
11	J A 26	26	J A 25	J A 24	E B 16	E B 16	E B 16	G	26	J A 36	J A 47	J A 45	J A 51	29	27	J A 36	J A 25	J A 47	J A 32	J A 25	J A 51	J A 22	J A 25	J A 20
12	J A 21	20	E B 16	28	E B 16	E B 16	E B 16	G 18	J A 30	J A 40	J A 39	J A 33	J A 27	J A 27	28	J A 31	J A 31	J A 25	J A 20	J A 49	J A 49	J A 26	J A 32	J A 30
13	26	J A 31	30	33	22	25	E B 16	J A 24	27	J A 51	J A 61	J A 62	J A 101	J A 68	J A 64	J A 61	J A 53	J A 60	J A 49	J A 41	J A 28	J A 21	J A 23	J A 51
14	34	J A 25	29	J A 28	J A 23	J A 21	E B 16	G	25	28	J A 41	J A 104	51	J A 56	G	J A 29	25	J A 21	26	E B 16	E B 16	E B 16	E B 16	E B 16
15	E B 16	E B 16	E B 16	24	21	21	E B 16	25	32	39	G	39	J A 31	J A 30	G 26	21	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	26
16	26	J A 25	E B 16	J A 22	20	E B 16	E B 16	G	J A 26	32	30	J A 41	34	34	34	24	E B 16	E B 16	E B 16	E B 16	E B 16	23	E B 16	E B 16
17	E B 16	J A 31	19	E B 16	E B 16	J A 51	E B 16	G	25	32	32	32	G 31	G	28	G	J A 23	E B 16	20	J A 44	J A 24	27	J A 30	26
18	22	E B 16	18	E B 16	E B 16	20	E B 16	G	26	29	33	J A 35	G 30	J A 34	J A 27	J A 35	J A 41	J A 26	21	22	E B 16	27	25	21
19	21	E B 16	E B 15	E B 15	J A 22	E B 15	20	23	J A 25	34	J A 31	G 32	34	28	J A 33	J A 37	J A 26	E B 15	20	20	E B 16	E B 16	E B 16	23
20	26	26	J A 19	E B 16	20	E B 16	E B 16	G	J A 35	29	33	G 27	30	J A 42	J A 27	J A 43	J A 26	E B 16	E B 16	E B 16	E B 16	J A 26	E B 16	E B 16
21	E B 16	E B 16	22	J A 24	E B 16	E B 16	E B 16	J A 33	J A 23	J A 28	34	31	J A 43	30	25	24	J A 33	J A 36	38	J A 32	21	E B 16	E B 17	E B 16
22	E B 16	E B 16	E B 16	J A 18	E B 16	E B 16	E B 16	26	J A 25	34	J A 57	30	53	J A 56	J A 55	J A 60	J A 32	J A 51	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16
23	E B 16	20	J A 25	J A 26	J A 21	E B 16	E B 16	E B 16	J A 51	34	J A 49	J A 49	30	29	G	G 22	23	G	J A 28	J A 27	E B 16	J A 25	J A 25	E B 16
24	E B 16	E B 16	J A 51	J A 23	J A 23	19	E B 16	E B 16	J A 26	J A 27	J A 33	J A 39	J A 51	G	G	22	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	J A 28	26
25	E B 16	19	19	18	E B 16	E B 16	E B 16	E B 16	J A 23	J A 30	J A 51	J A 34	J A 33	33	28	22	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	J A 31	24
26	20	20	J A 25	J A 20	18	J A 24	22	22	J A 25	J A 52	J A 49	31	41	J A 39	J A 33	J A 33	J A 33	J A 27	J A 23	E B 16	E B 16	B J 19	J A 19	26
27	J A 26	J A 26	J A 26	J A 23	22	22	18	E B 16	34	G	59	J A 51	J A 77	J A 51	26	J A 26	E B 16	E B 16	22	E B 16	E B 16	E B 15	E B 16	E B 16
28	E B 16	21	E B 16	18	E B 16	E B 16	E B 16	23	J A 29	J A 37	J A 33	J A 38	J A 58	G	G	J A 22	J A 29	J A 37	J A 29	20	23	J A 25	20	E B 16
29	E B 15	J A 21	26	E B 16	20	20	E B 16	22	J A 31	J A 50	J A 51	G	J A 40	J A 32	26	G	25	23	22	23	20	22	E B 16	E B 16
30	E B 16	E B 16	E B 16	J A 84	19	23	23	24	29	28	33	J A 33	G	29	28	J A 22	J A 18	22	J A 22	J A 20	J A 25	20	E B 16	27
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
MED	22	20	22	24	20	20	E B 16	22	28	32	J A 36	39	J A 40	J A 33	28	J A 26	J A 26	J A 22	22	J A 24	22	22	20	24
U Q	J A 26	J A 26	J A 26	28	25	J A 24	18	J A 24	J A 32	J A 39	J A 49	J A 51	J A 53	J A 43	J A 34	J A 37	J A 33	J A 37	J A 29	J A 32	J A 31	27	J A 28	27
L Q	E B 16	E B 16	E B 16	E B 18	E B 16	E B 16	E B 16	G	J A 25	29	33	32	31	29	G 26	22	E B 19	16	E B 16	16	E B 16	E B 16	E B 16	E B 16

NOV. 2018 foEs (0.1MHz)

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IONOSPHERIC DATA STATION Wakkanai

NOV. 2018 fbEs (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

LAT.45°10.0'N LON.141°45.0'E SWEEP 1.0MHz TO 30.0MHz IN 15.0SEC IN MANUAL SCALING

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	E B 16	E B 16	E B 16	E B 16	E B 16	16	E B 16	22	29	30	36	38	36	30	27	G	G	G 17	E B 16	E B 17	E B 16	E B 16	E B 16	E B 16
2	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	22	G 26	31	29	G 29	32	G 27	26	G 22	16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16
3	16	E B 16	18	23	18	E B 16	E B 16	22	28	30	32	G 32	G 31	29	28	28	20	16	18	E B 16	17	17	E B 16	E B 16
4	E B 16	E B 16	E B 16	18	E B 16	E B 16	E B 16	20	25	27	31	28	28	28	G 25	25	24	G 16	23	19	20	19	E B 16	E B 16
5	18	18	16	16	16	16	G 16	G 18	30	35	36	42	37	G 24	29	A A 91	21	22	23	22	22	16	16	E B 16
6	E B 16	E B 16	22	18	16	E B 16	E B 16	G 16	G 22	G 24	26	28	30	30	26	23	G 20	E B 16	17	16	18	16	16	E B 16
7	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	20	24	42	29	36	28	28	27	20	16	E B 16	16	16	E B 16	16	16	E B 16
8	E B 16	16	16	16	E B 16	E B 16	E B 16	20	24	26	27	33	29	28	26	G 22	18	16	17	E A 24	17	E B 17	E B 16	18
9	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	18	22	26	29	34	29	40	25	26	21	20	E B 16	17	23	16	16	E B 16
10	18	16	E B 16	E B 16	E B 16	E B 16	E B 16	23	30	28	25	35	29	35	23	23	16	16	23	16	E B 16	E B 16	E B 16	21
11	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	G	23	32	28	28	29	28	25	25	G 17	G 19	17	E B 16	20	16	E B 16	E B 16
12	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	G 16	24	28	28	28	G 27	24	24	21	19	16	E B 16	19	E A 21	17	16	E B 16
13	E B 16	21	19	17	E B 16	E B 17	E B 16	20	25	27	30	30	28	E A 45	22	E A 43	E A 32	A A 60	A A 49	A A 41	E A 20	E B 16	E B 16	A 18
14	17	19	E B 16	16	E B 16	E B 16	E B 16	G	24	25	29	42	30	30	G	24	17	E B 17	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16
15	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	G 18	24	G 26	G	30	28	28	G 24	20	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16
16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	G	G 24	27	28	29	28	30	26	22	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16
17	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	G	23	30	30	30	G 29	G	25	G	20	E B 16	E B 16	E B 16	E B 16	E B 16	20	E B 16
18	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	G	G 24	26	G 28	31	G 29	28	26	26	22	17	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16
19	E B 16	E B 16	E B 15	E B 15	E B 16	E B 15	E B 16	G 16	24	28	30	G 28	32	G 26	26	24	24	E B 15	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16
20	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	G	30	26	31	G 27	G 28	G 26	24	21	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16
21	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	18	G 21	26	32	30	30	27	24	22	E B 18	24	E B 25	24	E B 16	E B 16	E B 17	E B 16
22	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	G 18	24	30	29	29	37	30	24	25	25	17	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16
23	E B 16	E B 16	18	E B 16	E B 16	E B 16	E B 16	E B 16	23	29	28	28	28	28	G	G 21	17	G	16	16	E B 16	E B 16	16	E B 16
24	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	24	G 25	G 25	28	28	G	G	20	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16
25	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	22	26	29	29	29	28	27	22	E B 16	E B 16	E B 16	E B 16	E B 16	16	E B 16	19
26	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	16	E B 16	E B 16	31	24	G 28	25	27	27	27	24	17	E B 17	E B 16	E B 16	E B 17	17	17
27	E B 17	E B 17	16	E B 16	E B 16	E B 16	E B 16	E B 16	27	G	28	29	30	26	25	20	E B 16	E B 16	E B 16	E B 16	E B 16	E B 15	E B 16	E B 16
28	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	16	26	22	30	28	G 26	G	G	G 20	22	A A 37	17	17	16	16	E B 16	E B 16
29	E B 15	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	24	26	27	G	27	25	24	G	18	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16
30	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	26	26	26	29	G	27	25	21	16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
MED	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	G	24	27	29	29	29	28	25	E G 22	18	16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16
U Q	16	16	16	16	E B 16	E B 16	E B 16	20	26	30	30	G	30	30	26	25	21	17	17	17	17	16	16	16
L Q	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	23	26	28	28	28	G	24	21	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16

NOV. 2018 fbEs (0.1MHz)

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IONOSPHERIC DATA STATION Wakkanai

NOV. 2018 fmin (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

LAT.45°10.0'N LON.141°45.0'E SWEEP 1.0MHz TO 30.0MHz IN 15.0SEC IN MANUAL SCALING

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	16	16	16	17	16	16	16	10	16	15	16	16	16	16	16	13	10	16	16	16	16	16	16	16
2	16	16	16	16	16	16	16	12	12	15	12	16	16	17	10	15	11	16	16	16	16	16	16	16
3	16	16	16	16	16	16	16	11	14	11	14	15	15	16	15	15	15	15	16	16	16	17	16	16
4	16	16	16	16	16	16	16	17	14	11	15	16	15	15	15	13	16	16	16	16	16	16	16	16
5	16	14	16	16	16	16	16	11	10	15	15	17	16	16	12	11	16	16	16	16	16	16	16	16
6	16	16	16	16	16	16	16	16	13	13	14	14	15	15	15	15	16	16	16	16	16	16	16	16
7	16	16	16	16	16	16	16	12	14	16	11	14	15	17	14	12	16	16	16	16	16	16	16	16
8	16	16	16	16	16	16	16	16	12	15	16	13	16	16	16	14	14	16	16	16	15	16	16	16
9	16	16	17	16	16	16	16	16	12	15	15	15	16	16	13	15	16	16	16	16	16	16	16	16
10	16	16	16	16	16	16	16	11	16	12	16	16	16	16	16	16	16	16	16	16	16	16	16	16
11	16	16	16	16	16	16	16	13	12	15	14	14	15	16	16	15	16	16	16	16	16	16	16	16
12	16	17	16	16	16	16	16	16	12	10	14	12	12	12	14	10	16	16	16	16	16	16	16	16
13	16	16	17	16	16	17	16	16	13	16	15	15	15	16	9	10	16	15	17	16	16	16	16	16
14	16	16	16	16	16	16	16	16	15	16	16	16	16	16	15	16	16	16	16	16	16	16	16	16
15	16	16	16	16	16	16	16	14	16	16	16	16	16	17	17	16	16	16	16	16	16	16	16	16
16	16	16	16	16	16	16	16	14	15	16	14	16	16	16	16	10	16	16	16	16	16	16	16	16
17	16	16	16	16	16	16	16	16	16	16	15	16	16	16	15	16	16	16	16	16	16	16	16	16
18	16	16	16	16	16	16	16	16	16	15	16	16	16	16	16	16	16	17	16	16	16	16	16	16
19	16	16	15	15	15	15	16	12	12	16	16	14	15	15	15	16	16	15	16	16	16	16	16	16
20	16	16	16	16	16	16	16	15	12	15	15	15	16	16	16	16	16	16	16	16	16	16	16	16
21	16	16	16	16	16	16	16	13	16	17	16	17	17	17	16	16	16	16	16	16	16	16	17	16
22	16	16	16	16	16	16	16	17	16	17	17	16	16	16	16	16	16	16	16	16	16	16	16	16
23	16	16	16	16	16	16	16	16	13	15	15	15	15	15	16	16	16	16	16	16	16	16	16	16
24	16	16	16	16	16	16	16	16	16	16	16	16	16	16	15	16	16	16	16	16	16	16	16	16
25	16	16	16	16	16	16	16	16	16	16	16	15	16	16	16	15	16	16	16	16	16	16	16	16
26	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
27	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	15	16	16	16	16	16	15	16	16
28	16	16	16	16	16	16	16	17	16	16	16	14	16	15	15	16	16	16	16	16	16	16	16	16
29	15	16	16	16	16	16	16	16	16	16	16	15	13	15	12	15	16	16	16	16	16	16	16	16
30	16	16	16	17	16	16	16	16	16	16	16	15	16	16	15	16	15	16	16	16	16	16	16	16
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
MED	16	16	16	16	16	16	16	16	15	16	16	16	16	16	15	15	16	16	16	16	16	16	16	16
U Q	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
L Q	16	16	16	16	16	16	16	13	12	15	15	15	15	16	15	14	16	16	16	16	16	16	16	16

IONOSPHERIC DATA STATION Wakkanai

NOV. 2018 M(3000)F2 (0.01) 135°E MEAN TIME (G.M.T. + 9 H)

LAT.45°10.0'N LON.141°45.0'E SWEEP 1.0MHz TO 30.0MHz IN 15.0SEC IN MANUAL SCALING

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	318	F 302	F 324	F 309	F 310	335	358	377	388	394	374	348	351	377	362	361	382	372	298	303	315	F 326	295	344
2	321	F 277	F 305	F 297	F 288	F 363	348	383	373	374	372	355	378	375	359	375	393	349	333	329	331	351	338	338
3	317	326	318	323	F 331	F 368	363	399	363	396	368	377	390	369	374	373	380	391	345	315	345	338	325	321
4	F 277	318	F 279	340	331	F 358	358	386	359	370	372	369	379	V 347	363	364	388	336	366	351	352	F 293	286	286
5	352	304	304	321	343	313	301	363	369	347	347	380	V 327	349	350	A	329	355	345	364	313	311	332	304
6	315	303	341	F 281	F 316	F 302	346	351	387	346	343	355	357	334	365	367	362	372	239	309	341	334	329	328
7	341	F 273	318	317	331	339	327	389	358	378	374	381	365	V 333	346	371	377	385	342	306	323	324	321	321
8	333	328	319	327	356	353	359	377	365	366	350	343	360	343	371	371	371	362	R 298	299	333	330	309	320
9	308	324	330	347	322	F 356	F 307	391	369	363	364	336	368	363	376	363	376	378	345	332	352	327	327	308
10	F 308	F 310	F 314	F 317	F 334	334	360	401	357	389	345	351	383	364	355	360	381	361	331	335	314	312	303	330
11	344	334	348	F 309	F 327	F 327	F 324	389	375	359	362	340	382	372	399	390	379	382	328	327	320	323	314	F 302
12	F 282	F 289	320	F 332	F 306	F 345	F 338	394	374	369	356	369	343	358	353	374	382	395	349	335	315	326	336	302
13	298	322	308	320	F 314	333	340	378	369	382	386	373	398	227	377	245	263	A	A	A	312	350	286	F 314
14	F 310	F 299	F 299	325	314	375	361	390	396	383	337	372	383	349	377	368	402	V 361	335	327	318	337	324	321
15	F 311	315	315	338	326	368	343	388	371	390	382	374	388	359	371	383	375	333	334	345	335	349	350	329
16	328	320	325	311	313	338	338	384	378	405	366	390	380	362	376	379	374	347	313	353	356	357	313	322
17	313	298	303	328	333	374	383	400	388	364	366	374	343	376	372	364	375	378	342	312	357	335	340	317
18	298	298	294	F 309	309	F 342	F 318	382	389	377	385	381	388	384	401	383	367	389	315	340	318	317	293	293
19	301	289	322	F 302	F 328	361	F 321	385	374	398	359	359	393	385	377	345	383	359	350	325	319	304	315	346
20	320	297	303	327	277	342	364	404	359	367	360	375	343	333	386	361	376	353	329	329	319	342	F 341	F 312
21	F 300	F 280	F 294	F 339	306	F 340	328	390	386	379	353	330	373	372	352	363	370	333	342	345	314	332	333	349
22	F 298	F 321	F 320	F 329	329	328	334	370	387	386	368	377	378	370	354	389	364	381	352	343	F 320	301	F 301	F 254
23	F 284	F 316	F 345	F 306	F 319	F 334	353	409	394	358	359	377	381	386	374	380	383	347	354	303	F 330	F 319	273	309
24	F 298	318	F 283	F 319	309	F 281	296	397	390	392	358	374	398	377	377	384	378	347	358	307	337	346	F 302	F 284
25	F 294	F 255	F 294	F 298	F 298	F 347	F 366	396	382	390	361	379	356	363	377	352	391	358	372	311	372	314	313	381
26	309	333	335	347	337	340	351	382	377	236	368	382	382	373	362	372	378	381	316	348	368	372	307	F 284
27	290	F 274	F 307	F 287	F 296	331	F 331	396	400	400	333	358	378	344	338	374	383	348	363	340	F 287	316	343	363
28	338	338	314	F 306	301	319	360	395	386	378	378	368	395	383	373	384	380	A	358	327	344	332	359	352
29	340	329	F 289	F 326	284	333	355	387	370	372	358	378	391	387	380	387	390	373	318	333	366	335	339	324
30	298	278	294	F 312	F 281	F 328	340	379	385	410	369	380	372	393	313	363	366	400	343	334	325	310	315	314
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	29	30	28	29	29	30	30	30	30
MED	310	307	314	F 320	315	340	344	388	376	378	363	374	378	366	372	371	378	362	342	329	328	328	318	320
U Q	321	322	322	328	331	356	359	396	387	390	372	378	388	377	377	382	383	381	351	342	345	338	336	330
L Q	298	F 289	F 299	F 309	306	331	328	382	369	366	356	355	360	349	355	363	371	348	323	312	318	316	303	304

NOV. 2018 M(3000)F2 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

NOV. 2018 M(3000)F1 (0.01) 135°E MEAN TIME (G.M.T. + 9 H)

LAT.45°10.0'N LON.141°45.0'E SWEEP 1.0MHz TO 30.0MHz IN 15.0SEC IN MANUAL SCALING

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1										L	L			L	L	L								
2									A	L	L	L	L	L	L			L						
3									L	L	L	L	L	L										
4								L		L	L	L	L	L	L									
5											L		L	L	L	A								
6							L		L	390	L	375	L		L	L								
7										A	L		L	L	L	L								
8									L	L	L		L	L	L	L								
9								L	L		L	L	L		L									
10												L	403	539	391									
11									L	L	L	L	L	L										
12								L	L	L	L	L	L	L	L									
13										L	L	L	L	A	A	A	A	A						
14											L		L		L									
15										L	L	L	L											
16										L	L	L	L	L										
17									L		L	L	L											
18											L	L	L	L										
19										L	L	L	L	L										
20										L		L	L	L	L									
21										L		L	L	L	L									
22										L	L	L												
23											L	L	L	L	L									
24										L	L	L	L	548										
25										L	L	L	L	L										
26										A	L	L	L	L										
27										L		L	L	L										
28											L	L	L	L	L			A						
29										L	L	L	L	L	L									
30										L	L	L	L	L	537									
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT										1		1	1	2	2									
MED										390		375	403	544	464									
U Q																								
L Q																								

NOV. 2018 M(3000)F1 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

NOV. 2018 h'F2 (KM) 135°E MEAN TIME (G.M.T. + 9 H)

LAT.45°10.0'N LON.141°45.0'E SWEEP 1.0MHz TO 30.0MHz IN 15.0SEC IN MANUAL SCALING

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1										206	234			222	228	220								
2									216	228	228	234	222	216	224			216						
3									234	214	242	222	218	234										
4								204		240	216	240	218	236	236									
5											264		220	244	230	A								
6							254		226	254	256	270	236		240	220								
7										242	242		240	246	248	228								
8									224	244	224		228	240	236	220								
9								206	206		244	244	222		216									
10												244	220	230	244									
11									214	240	226	230	220	232										
12								222	216	224	240	234	240	240	248									
13										222	222	236	222	A	212	E A 460	E A 416	A						
14											274		222		226									
15										222	222	222	230											
16										218	244	222	222	222										
17									204		230	236	226											
18											226	218	222	222										
19										220	228	234	216	218										
20										236		224	224	218	218									
21										218		310	220	226	234									
22										228	236	224												
23											224	224	226	226	224									
24										212	230	218	214	224										
25										224	238	230	230	230										
26										A 410	240	214	224	224										
27										216		244	224	220										
28											222	232	216	216	218			A						
29										220	226	220	220	218	222									
30										202	218	218	218	218	342									
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							1	3	8	22	26	25	28	23	18	5	1	1						
MED							254	206	216	223	230	230	222	224	229	220	E A 416	216						
U Q								222	225	240	242	238	226	234	240	344								
L Q								204	210	218	224	222	220	218	222	220								

NOV. 2018 h'F2 (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Wakkanai

NOV. 2018 h'F (KM) 135°E MEAN TIME (G.M.T. + 9 H)

LAT.45°10.0'N LON.141°45.0'E SWEEP 1.0MHz TO 30.0MHz IN 15.0SEC IN MANUAL SCALING

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	Q242	Q258	Q246	Q238	Q238	214	206	164	216	194	212	246	228	226	182	188	208	196	240	268	242	208	246	238
2	246	Q262	246	Q220	Q226	188	206	194	A	202	192	176	200	180	184	204	188	194	194	224	232	212	212	200
3	242	242	256	254	254	208	204	198	200	190	224	200	200	194	230	216	212	192	202	218	240	246	244	240
4	Q254	Q260	242	230	230	202	228	178	218	198	198	192	182	188	188	218	208	200	228	232	232	236	Q260	Q244
5	232	246	248	260	252	262	248	202	216	234	A234	216	200	198	218	A	234	214	236	214	224	238	238	230
6	242	246	238	260	234	254	216	232	216	188	216	200	200	224	224	200	224	200	A	250	248	250	240	226
7	226	Q260	232	256	234	244	238	218	210	A	196	228	208	200	198	206	206	206	242	A	250	236	266	248
8	248	248	252	238	226	208	220	216	200	192	188	248	198	200	214	202	194	192	A	A	262	226	244	270
9	Q250	242	222	226	228	200	198	186	174	222	192	210	200	224	196	216	208	198	212	252	222	230	248	248
10	Q258	246	Q246	238	Q224	224	198	186	234	204	228	216	194	196	198	210	206	194	224	244	246	246	246	232
11	228	222	210	234	248	Q206	216	200	192	200	194	194	208	208	214	214	202	202	222	238	216	232	248	Q246
12	Q272	Q272	Q236	224	Q236	218	Q206	188	192	200	196	196	196	208	210	220	214	188	234	240	A	240	240	284
13	280	102	260	246	244	220	E B236	212	212	212	194	176	176	A	A	A	A	A	A	A	E A250	244	Q250	A250
14	258	280	252	252	252	200	200	208	208	208	190	224	186	224	196	218	196	188	244	238	238	238	216	252
15	244	248	248	218	260	210	200	196	206	196	198	198	198	208	202	214	196	204	238	220	214	214	222	228
16	230	234	224	260	242	236	210	204	204	198	198	198	H178	200	222	222	190	200	B236	224	228	228	234	260
17	244	278	Q248	248	226	210	198	194	H168	206	202	218	192	216	220	230	208	208	230	248	220	232	248	248
18	Q242	Q254	Q236	Q244	Q246	Q228	240	206	212	216	H188	180	198	196	210	210	204	192	242	238	E B224	236	260	264
19	258	258	236	236	Q242	206	222	200	194	198	198	184	202	198	210	218	202	214	224	224	242	Q230	244	236
20	Q252	Q260	Q256	234	278	224	192	192	220	200	236	200	200	182	198	210	204	208	226	226	242	230	216	Q238
21	Q248	266	Q246	Q224	Q244	214	200	200	206	196	240	208	200	192	198	214	210	E A240	250	228	250	238	238	226
22	244	256	222	240	248	218	218	206	192	202	194	204	210	224	190	192	200	218	204	220	Q222	Q190	242	Q260
23	Q242	Q230	Q200	236	Q250	224	204	192	200	208	186	186	194	196	196	210	198	196	228	248	Q212	Q210	286	Q238
24	208	Q250	Q282	262	244	276	216	196	200	178	178	198	184	192	212	212	200	202	218	258	230	202	Q236	Q236
25	Q222	Q246	Q240	Q238	Q238	212	198	188	200	H180	192	192	184	198	218	214	200	204	224	256	214	252	252	216
26	256	244	234	214	250	228	238	208	210	A	198	190	186	202	218	220	202	190	A248	228	210	218	Q250	264
27	Q224	Q252	236	Q256	Q246	214	214	200	206	194	200	200	188	H170	218	218	208	208	238	214	Q248	Q242	Q224	Q202
28	212	244	254	Q264	Q256	Q250	202	206	206	218	196	196	192	192	184	208	200	A	218	254	234	234	210	214
29	214	220	234	Q248	Q242	236	218	198	212	198	194	200	192	190	196	190	200	200	224	244	208	208	240	250
30	Q246	Q246	Q246	Q224	Q246	232	228	190	192	186	192	202	188	198	198	212	196	194	206	242	260	Q228	Q250	Q250
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	30	30	29	28	30	30	30	29	29	28	29	28	27	27	29	30	30	30
MED	244	248	244	238	244	218	210	199	206	199	196	200	197	198	202	213	202	200	228	238	232	232	244	242
U Q	252	Q260	248	254	250	232	222	206	212	207	202	210	200	208	218	218	208	207	238	248	247	238	250	250
L Q	230	244	234	230	234	208	200	192	197	194	192	192	188	192	196	207	199	194	218	224	221	218	236	230

IONOSPHERIC DATA STATION Wakkanai

NOV. 2018 h'E (KM) 135°E MEAN TIME (G.M.T. + 9 H)

LAT.45°10.0'N LON.141°45.0'E SWEEP 1.0MHz TO 30.0MHz IN 15.0SEC IN MANUAL SCALING

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1							B	114	112	112	112	108	108	106	106	108	114	108						
2							B	110	110	106	106	106	106	106	108	114	106	B						
3							B	112	120	106	116	116	110	110	A	A	A	A						
4							B	B 110	106	106	104	108	108	108		A	A	118						
5							110	120	106	106	106	102	102	102	102	A	A	A						
6							B	116	116	116	108	110	110	110	110	102	112	A						
7							B	102	102	102	102	98	A	98	104	A	A	A						
8							B	126	120	106	106	106	A	A	106	126	108	B						
9							B	108	100	104	104	98	106	A	A	A	A	A						
10							B	124	118	112	110	102	A	A	A	A	B	A						
11							B	A 134	116	92	102	102	110	100	100	A	94	106						
12							B	116	116	100	100	108	108	108	108	100	A	A						
13							B	A	112	118	A	A	A	A	A	A	A	A						
14							B	146	114	106	A	A	102	102	102	112	A	A						
15							B	120	120	120	110	110	110	100	100	100	B	B						
16							B	118	118	118	112	122	104	104	100	100	B	B						
17							B	146	110	110	110	110	110	110	110	110	A	B						
18							B	E B 136	120	106	110	102	102	102	102	A	A	A						
19							A	110	114	114	94	104	104	104	A	A	A	B						
20							B	154	110	110	110	110	104	104	96	A	A	B						
21							B	112	124	110	110	102	108	98	110	114	A	A						
22							B	122	A	110	110	110	102	A	A	A	A	A						
23							B	B	108	108	108	108	108	108	110	104	A	B 170						
24							B	B	A	104	106	A	A	106	112	110	B	B						
25							B	B	A	A	A	A	A	110	102	112	B	B						
26							B	A	112	A	A	100	A	100	A	A	A	A						
27							B	B	A	110	A	110	110	102	114	98	B	B						
28							B	A	A	A	A	104	104	106	106	114	A	A						
29							B	100	114	112	112	112	106	A	104	104	A	B						
30							A	96	114	114	96	96	104	108	114	A	A	B						
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							1	22	25	27	24	26	23	24	23	16	5	4						
MED							110	116	114	110	108	106	106	105	106	109	108	113						
U Q								126	118	112	110	110	110	108	110	113	113	144						
L Q								110	110	106	105	102	104	102	102	101	100	107						

NOV. 2018 h'E (KM)

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IONOSPHERIC DATA STATION Wakkanai

NOV. 2018 h'Es (KM) 135°E MEAN TIME (G.M.T. + 9 H)

LAT.45°10.0'N LON.141°45.0'E SWEEP 1.0MHz TO 30.0MHz IN 15.0SEC IN MANUAL SCALING

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	102	B	102	94	90	90	B	110	130	116	106	102	102	98	100	G	G	100	B	128	B	B	B	94
2	108	104	B	100	92	92	88	150	88	126	110	104	154	122	156	146	94	B	B	116	112	102	116	92
3	92	B	96	92	92	100	100	112	136	106	106	100	100	94	96	94	94	94	94	102	102	102	B	B
4	96	B	B	92	92	92	B	164	140	130	104	100	98	98	98	92	94	100	Q 96	96	96	94	92	104
5	98	98	98	100	100	100	94	144	114	108	108	104	100	110	102	102	102	102	98	98	98	98	98	98
6	98	108	102	102	102	B	B	120	104	108	106	106	106	114	118	138	106	104	100	106	102	100	100	100
7	98	96	104	104	B	B	B	134	116	100	98	100	100	150	94	94	96	90	96	90	102	102	102	102
8	102	102	94	96	96	96	B	100	118	104	104	98	104	104	102	130	110	80	94	94	94	94	B	104
9	98	94	94	94	94	94	98	96	116	92	108	100	94	94	94	94	98	106	B	106	102	102	102	102
10	92	94	96	96	B	96	B	128	116	106	100	100	100	96	96	94	114	100	96	102	96	96	96	96
11	96	96	96	90	B	B	B	G	132	108	104	100	100	144	144	88	88	102	102	102	108	98	98	98
12	98	98	B	90	B	B	B	128	108	104	104	104	104	104	126	96	96	96	96	102	102	98	98	98
13	102	98	90	94	98	96	B	108	142	108	96	96	96	90	90	90	88	88	96	90	90	90	100	100
14	102	96	96	96	96	94	B	G	148	100	98	96	100	98	G	96	90	90	90	B	B	B	B	B
15	B	B	B	100	88	88	B	114	104	102	G	100	136	92	120	120	B	B	B	B	B	B	B	94
16	94	96	B	92	92	B	B	G	142	102	122	102	102	86	84	136	B	B	B	B	B	116	B	B
17	B	98	92	B	B	94	B	G	140	132	144	132	118	G	118	G	114	B	90	104	100	100	100	100
18	96	B	96	B	B	96	B	G	140	132	110	96	96	90	92	92	92	92	94	96	B	96	102	96
19	96	B	B	B	98	B	100	122	110	102	98	98	92	90	88	88	88	B	88	90	B	B	B	98
20	102	98	98	B	90	B	B	G	120	156	100	106	104	94	90	90	88	B	B	B	B	98	B	B
21	B	B	94	90	B	B	B	94	112	102	152	158	102	140	140	126	94	90	98	98	98	B	B	B
22	B	B	B	98	B	B	B	106	106	106	112	132	92	90	90	84	84	94	B	B	B	B	B	B
23	B	94	90	90	90	B	B	B	104	104	96	96	156	148	G	148	94	G	100	96	B	94	100	B
24	B	B	90	90	90	98	B	B	100	98	94	94	90	G	G	146	B	B	B	B	B	B	100	100
25	B	100	88	88	B	B	B	B	104	100	100	94	94	104	156	160	B	B	B	B	B	B	102	94
26	94	94	94	94	100	98	100	116	104	96	96	136	86	86	86	86	86	90	90	B	B	90	98	102
27	94	94	90	90	90	90	90	B	100	G	100	100	100	96	142	86	B	B	88	B	B	B	B	B
28	B	88	B	88	B	B	B	110	106	98	100	100	96	G	G	96	96	96	96	96	102	102	102	B
29	B	94	96	B	96	96	B	126	106	100	126	G	88	88	88	G	92	90	94	96	104	104	B	B
30	B	B	B	88	92	94	96	124	102	148	108	94	G	156	150	92	94	96	96	96	94	94	B	104
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	20	20	21	25	20	18	8	20	30	29	29	29	29	27	26	27	24	20	21	21	17	21	17	20
MED	98	96	96	94	92	95	97	118	113	104	104	100	100	98	99	94	94	95	96	98	102	98	100	99
U Q	102	98	97	97	97	96	100	128	132	112	109	104	104	114	126	130	97	100	97	103	102	102	102	102
L Q	95	94	91	90	90	92	92	109	104	100	99	97	95	90	90	90	89	90	92	96	96	94	98	96

NOV. 2018 h'Es (KM)

IONOSPHERIC DATA STATION Wakkanai

NOV. 2018 TYPES OF Es 135°E MEAN TIME (G.M.T. + 9 H)

LAT.45°10.0'N LON.141°45.0'E SWEEP 1.0MHz TO 30.0MHz IN 15.0SEC IN MANUAL SCALING

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	F1		F1	F1	F2	F2		C1	C3	C2	C3	C4	C2	CH21	C2			L1		F1				F1
2	F1	F1		F1	F1	F1	L1	H1	LC12	C2	C2	C2	C1	C1	C1	C1	L1			L1	F1	F1	F1	F3
3	F3		F4	F4	FQ22	FQ11	L1	L1	CL21	C2	C2	CL42	LC22	LC21	L2	L3	L1	L1	F3	F1	F2	F2		
4	F2			F3	F2	F2		H1	HL21	C2	C2	C2	LC11	LC11	LC21	L3	L2	L1	F2	F2	F3	F2	F1	F1
5	F2	F5	F2	F2	F4	F4	L2	H1	C3	C2	C3	C3	C3	C2	C3	LQ41	LQ41	LQ41	F3	F4	FQ41	F2	F3	F2
6	F1	F1	F6	F3	F2			C2	CLQ21	CL21	C2	C1	C2	C3	C2	C1	C4	L1	F7	F4	F4	F3	F2	F1
7	F1	F1	F1	F1				C2	C2	C3	C3	C1	L3	CL21	LC21	L2	L1	L1	F1	F2	F2	F2	F2	F2
8	F1	F3	F2	F2	F1	F1		LC12	C2	C2	CL11	LC11	LC11	L2	L2	CL11	L1	C2	F4	F3	F2	F1		F3
9	F2	F1	F2	F1	FF21	F1	L1	LC11	CL22	C2	C2	C3	LC21	L3	L3	L4	L3	LL31		F2	F3	FF21	F2	F1
10	F4	FQ31	FQ11	F1		F1		C1	C2	C2	C4	C2	L2	L4	L3	L3	L1	L1	F3	F2	F1	F3	F2	F4
11	FQ41	F1	F1	F1					C1	C3	C2	L2	LC11	CC11	CL11	L2	LC11	L3	L3	L2	F4	F2	F3	F2
12	F1	F1		F2				C1	C2	C4	C3	C2	C2	C2	C1	LC11	L3	L2	F1	F2	F2	F1	F2	F2
13	F1	F3	F3	F4	F1	F1		LC11	H1	H1	LQ31	LL21	LQ31	LQ52	LQ42	LQ42	LQ51	L4	F3	F2	F1	F1	F1	F5
14	F3	F3	F1	F2	F2	F1			C1	LC11	L2	L3	LC11	L2		LC11	L1	L1	F1					
15				F1	F1	F1		CC11	LC21	C2		LC21	C2	LC11	LC11	C1								F2
16	F1	F1		F2	F2				H1	LC11	C2	LC11	LC11	LC11	LC11	LC11						F1		
17		F1	F1			F1			C1	C1	C1	C1	C1		C1		L1		F1	F2	F1	F1	F4	F2
18	F2		F1			F1			F1	C1	L1	L2	LC11	LC21	LC11	L2	L2	L3	F1	F1		F2	F1	F1
19	F1				F1		L1	C1	C2	C2	LC11	C2	LC11	LC21	L2	L2	L2		F1	F1				F1
20	F1	F2	F1		F1				C2	HL12	LC21	C1	CL11	L2	LC11	L2	L1					F1		
21			F1	F1				LC11	L2	L2	C1	HL11	LC11	HL11	C1	C1	L2	L2	F1	F1	F1			
22				F1				C1	L1	L2	C1	C1	L3	L2	L3	L3	L2	L1						
23		F1	F2	F2	F1				C2	C2	C2	C2	HL11	HL11		H1	L1		F2	F2		F1	F2	
24			F1	F2	F2	F1			L2	L2	L2	L2	L2			C2							F1	F1
25		F1	F2	F1					L3	L3	L2	L3	L2	L2	HL11	HL11							F2	F2
26	F1	F2	F2	F2	F1	F1	L1	C1	LC11	L4	L4	CL22	L2	CL21	C4	L3	L3	L3	F2			F1	F1	F1
27	F2	F2	F3	F1	F1	F1	L1		L3		L4	L2	L2	LC21	H1	LC21			F1					
28		F1		F1				L1	L3	L4	L2	L3	L2			LC31	L5	L5	F3	F2	F2	F1	F1	
29		F2	F1		F1	F1		CL11	C3	CL13	CL12		LC21	L3	LC22		LC12	L1	F2	FF21	F1	F1		
30				F1	F1	F1	L2	C1	C2	C2	CL21	C2		HL11	HL11	L2	L1	L1	F1	F2	F2	F1		F1
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT																								
MED																								
U Q																								
L Q																								

NOV. 2018 TYPES OF Es

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

NOV. 2018 fxI (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

LAT.35°43.0'N LON.139°29.0'E SWEEP 1.0MHz TO 30.0MHz IN 15.0SEC IN MANUAL SCALING

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	X 34	X 35	X 33	X 33	X 31	X 33													X 36	X 37	X 41	X 41	X 39	X 39
2	X 42	X 38	X 40	X 42	X 42	X 40												X 43	X 38	X 39	X 41	X 39	X 41	X 39
3	X 40	X 41	X 42	X 38	X 40	43												X 50	X 36	X 33	X 34	X 39	X 38	X 39
4	X 37	X 39	X 43	X 44	X 43	X 30												X 51	X 33	X 38	X 34	X 35	X 36	X 37
5	39	X 36	X 36	X 37	X 36	X 32												X 68	X 55	X 47	X 44	X 47	X 50	X 53
6	X 47	X 47	X 49	X 48	X 48	X 39			X 64									X 44	X 43	X 34	X 38	X 39	X 40	X 36
7	X 36	X 36	X 35	X 35	X 35	X 32												X 44	X 34	X 35	X 36	X 39	X 39	X 40
8	X 39	X 39	X 37	X 38	X 35	X 30													X 30	X 32	X 36	X 38	X 38	X 36
9	X 36	X 39	X 37	X 33	X 36	X 29												X 43	X 32	X 34	X 37	X 38	40	42
10	39	40	41	54	52	X 36												X 47	X 35	X 39	X 41	X 42	X 41	X 40
11	X 38	X 40	X 37	X 36	X 36	X 37												X 52	X 38		X 40	X 36	X 37	X 37
12	44	44	40	X 36	40	39												X 50	X 37	X 36	X 34	X 29	X 34	X 37
13	X 37	X 34	X 36	X 37	X 36	X 33												X 52	X 34	X 35	X 36	X 38	X 40	X 39
14	X 40	X 37	X 37	X 36	X 38	X 32												X 51	X 36	X 32	X 36	X 34	X 35	X 36
15	X 34	X 33	X 30	X 32	X 32	X 30												X 42	X 39	X 39	X 41	X 34	X 36	X 33
16	36	35	37	X 34	X 32	X 30												X 53	X 35	X 33	X 34	X 32	37	X 33
17	X 33	X 33	X 32	X 32	X 33	X 31												A	X 40	X 38	X 40	X 37	X 33	X 33
18	X 34	X 32	X 32	X 33	X 32	35	X 34											A	X 37	X 34	X 37	X 38	X 38	X 36
19	X 36	X 35	X 35	X 36	X 37	X 31												X 46	X 35	X 34	X 35	X 38	X 38	X 34
20	X 36	X 36	X 33	X 34	X 33	X 32	41												X 34	X 35	X 38	X 32	X 33	X 36
21	X 39	X 36	X 36	X 36	X 45	X 26												X 45	X 38	X 40	X 35	X 35	X 34	X 35
22	X 36	X 36	X 35	X 36	X 36	X 32												X 37	X 32	X 41	X 33	X 31	X 32	X 32
23	38	38	X 33	X 35	X 36	48	47											X 42	X 33	X 38	X 37	X 43	X 41	42
24	42	40	40	40	40	X 37	39											X 36	X 32	X 38	X 37	X 37	X 34	34
25	35	35	35	36	36	X 31													X 39	X 28	X 29	X 31	X 30	X 32
26	X 31	X 32	X 32	X 31	X 31	X 28	X 29											X 40	X 34	X 34	X 37	X 36	X 30	X 34
27	X 36	X 33	X 35	X 32	X 33	X 33	X 27											A	A	C	O X 38	35	X 33	38
28	X 33	X 32	X 31	X 31	X 32	X 30	X 30										X 52	X 39	X 35	X 34	X 38	X 38	X 37	X 33
29	37	37	34	X 29	X 29	X 29	X 31											X 38	X 36	A	X 37	X 42	X 28	X 30
30	36	X 33	X 31	X 32	X 32	X 30	X 29											X 38	X 32	X 34	X 33	X 37	X 38	X 34
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	9		1								1	23	29	27	30	30	30	30
MED	X 36	X 36	X 36	X 36	X 36	X 32	X 31		X 64								X 52	X 44	X 35	X 35	X 37	X 38	X 37	X 36
U Q	X 39	X 39	X 37	X 37	X 40	X 36	40											X 51	X 38	X 38	X 38	X 39	X 39	X 39
L Q	X 36	X 34	X 33	X 33	X 32	X 30	X 29											X 40	X 34	X 34	X 35	X 35	X 34	X 34

NOV. 2018 fxI (0.1MHz)

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NOV. 2018 foF2 (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

LAT.35°43.0'N LON.139°29.0'E SWEEP 1.0MHz TO 30.0MHz IN 15.0SEC IN MANUAL SCALING

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	28	28	27	27	25	27	44	61	50	58	66	66	66	67	68	66	64	43	30	31	35	35	33	33
2	36	32	34	36	36	34	39	49	53	66	70	67	64	60	61	60	49	37	32	32	35	33	35	33
3	34	35	36	32	34	F	34	44	57	62	59	56	56	57	56	56	54	44	30	27	28	32	32	32
4	32	33	37	38	37	24	31	48	46	54	55	65	57	52	56	58	50	45	27	32	28	29	30	31
5	F	30	30	31	30	26	34	52	65	66	74	91	72	59	70	66	62	62	50	41	38	41	44	47
6	41	41	43	42	42	33	36	53	58	66	66	67		61	51	60	52	38	37	28	32	33	34	30
7	30	30	29	29	29	26	33	53	56	56	58	71	55	58	52	59	48	38	28	29	30	33	33	34
8	33	33	31	32	29	24	31	53	62	63	70	57	53	56	61	69	53	42	24	26	30	32	32	30
9	30	33	31	27	30	23	30	45	53	54	60	64	67	64	61	58	55	37	26	28	31	32	F	F
10	F	F	F	F	F	30	34	50	52	59	60	69	68	68	70	58	55	41	29	33	35	36	35	34
11	32	34	31	30	30	31	34	58	55	59	56	62	72	V 83	62	58	50	46	32	A	34	30	31	31
12	F	F	F	30	F	F	28	51	60	55	59	58	68	72	66	75	55	44	31	30	28	23	28	30
13	31	28	30	31	30	27	32	51	59	60	64	62	60	63	57	58	59	46	28	29	30	32	34	33
14	34	31	31	30	32	26	28	44	49	51	55	61	61	70	55	46	51	45	30	26	30	28	29	30
15	28	27	24	26	26	24	26	49	50	52	55	56	51	58	57	60	49	36	33	33	35	28	30	27
16	F	F	F	28	26	24	29	46	49	54	62	57	56	56	60	61	51	47	29	27	28	26	F	27
17	27	27	26	26	27	25	25	44	44	50	56	61	51	57	61	52	52	A	34	32	34	31	27	27
18	28	26	26	27	26	F	28	46	52	56	60	62	51	62	62	52	49	A	31	28	30	32	32	30
19	30	29	29	30	31	25	28	48	58	52	69	64	59	56	58	52	46	40	29	28	29	32	32	28
20	30	30	27	28	27	26	F	51	54	58	60	68	63	59	55	48	55	50	28	29	32	26	27	30
21	33	30	30	30	39	20	26	49	52	50	57	63	64	63	55	53	49	39	32	34	29	28	28	29
22	30	30	29	30	30	26	29	52	66	60	54	68	61	65	50	50	50	31	26	35	27	25	26	26
23	F	F	27	30	30	F	F	42	47	53	59	V 58	55	52	55	51	49	36	27	32	31	37	35	F
24	F	F	F	F	F	31	F	42	46	53	61	66	58	56	52	46	44	30	26	32	31	31	28	F
25	F	F	F	F	F	25	23	47	50	45	52	66	61	55	52	50	46	33	33	22	23	25	24	26
26	25	26	26	25	25	22	23	42	46	49	64	58	53	52	48	56	50	34	28	28	31	30	24	28
27	30	27	29	26	27	26	21	43	52	53	65	60	52	55	52	52	51	A	A	C	S 32	F	27	F
28	27	26	25	25	25	24	24	46	53	51	60	66	57	56	52	48	46	33	29	28	32	32	31	27
29	F	F	F	23	23	23	25	50	56	55	57	55	59	56	52	48	42	32	30	A	31	36	22	24
30	F	26	25	26	26	24	23	48	48	48	52	53	50	59	51	44	46	32	26	28	27	31	32	28
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	21	23	24	27	26	26	27	30	30	30	30	30	29	30	30	30	30	27	29	27	30	29	28	26
MED	30	30	29	30	30	26	29	48	52	54	60	62	59	58	56	56	50	39	29	29	31	32	31	30
U Q	33	33	31	31	31	27	34	51	57	59	64	66	64	63	61	60	54	45	32	32	32	33	33	32
L Q	28	27	26	26	26	24	25	45	49	52	56	58	54	56	52	50	49	34	28	28	29	28	28	27

NOV. 2018 foF2 (0.1MHz)

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IONOSPHERIC DATA STATION Kokubunji

NOV. 2018 foF1 (0.01MHz) 135°E MEAN TIME (G.M.T. + 9 H)

LAT.35°43.0'N LON.139°29.0'E SWEEP 1.0MHz TO 30.0MHz IN 15.0SEC IN MANUAL SCALING

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1											A	A	U L 416	U L 428	L									
2										L	L	U L 412	380	A		L								
3									L	L	L	U L 428	L	A	A									
4									L		A	U L 396	L	U L 428	A									
5								U L 248		L	U L 432	A	L	L	L									
6								L				392		L										
7									L	L	L	U L 364	L	L										
8										A	L	U L 376	L	L	L									
9										L	L	A	A	L	L									
10											L	L	A	L	L									
11									L	A	L	U L 416	U L 432							A				
12										L	L	L	L	L	L									
13										L	L	U L 404	U L 428											
14												A												
15											L	L	L	U L 408										
16										L	L	L	U L 396	U L 400		A								
17										A	L	U L 416			U L 348	L								
18										A	L	L		U L 436	L									
19										L	L	L	L	L	L									
20											L	U L 428		A										
21										L	L		L											
22										L	L	U L 404	L	U L 384		U L 288								
23								L		A	A	L	L	L										
24											U L 384	U L 400	U L 424		L									
25									L		A	392		L	U L 380									
26											U L 380	L	U L 404											
27										L	396		404	A										
28										L	U L 400	L	A	U L 388										
29									L	L	L	L	L	L										
30										L	L	L	L	L										
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								1			5	13	8	7	2	1								
MED								U L 248			U L 396	U L 404	U L 410	U L 408	U L 364	U L 288								
U Q											U L 416	U L 416	U L 426	U L 428										
L Q											U L 382	392	400	U L 388										

NOV. 2018 foF1 (0.01MHz)

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NOV. 2018 foE (0.01MHz) 135°E MEAN TIME (G.M.T. + 9 H)

LAT.35°43.0'N LON.139°29.0'E SWEEP 1.0MHz TO 30.0MHz IN 15.0SEC IN MANUAL SCALING

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1								B 196	256		A	A	A	A	A	U R 284	244	U R 192	B							
2								B U R 204	A	A	308	U R 320	312	U A 288	R	U R 248	U A 200									
3								B 200	U R 268	280	U R 312	A	A	A	288	U A 240	B									
4								B U R 224	264	A	A	A	A	A	A	A	A									
5								B B	A	A	A	A	R	U R 300	R	U R 252	A									
6								B R		280	A	A		U R 292	A	A	A									
7								B 180	A	A	A	A	U R 296	U R 284	U R 268	A	U R 192									
8								B A	A	A	A	A	A	U R 296	A	A	A	B								
9								B 192	244	A	R	A	A	U R 288	A	A	B									
10								B U R 208	A	A	A	A	A	R	U A 268	A	B									
11								B U A 192	A	A	A	A	A	A	U R 280	A	B			A						
12								B 196	244	U R 300	A	A	U A 300	A	A	U R 236	A									
13								B R	R	A	A	A	U R 292	U R 276	U R 268	R	A									
14								B 188	U A 260	280	300	A	320	U A 288	U R 268	U A 232	B									
15								B U R 204	A	U A 280	R	R	U R 308	R	264	U R 240	B									
16								B U A 180	A	U A 280	U R 312	U R 300	R	U R 288	260	A	B									
17								B B	248	292	A	A	A	A	A	A	B									
18								U A 188	A	A	A	U R 304	U R 288	U A 284	U R 256	A	A									
19								B U A 188	U R 264	R	R	R	R	U R 300	U R 272	U R 240	B									
20								B U R 188	A	U R 296	U R 304	A	A	A	A	A	A	B								
21								B A	244	268	R	R	300	U A 276	A	A	B									
22								B B	A	U R 292	R	A	R	U A 288	U R 264	U R 236	B									
23								B A	228	272	A	A	A	U R 288	A	U R 240	B									
24								B	A	A	A	R	R	U A 280	R	A	A									
25								B B	U R 240	U A 272	316	A	U A 296	A	U R 268	A	A	B								
26								180	U R 248	280	A	A	A	A	U R 272	228	172									
27								B	240	272	A	288	R	U R 276	A	U R 228	A									
28								B	A	A	A	A	A	A	A	A										
29								B	R	R	A	R	U R 312	U R 288	U R 268	U A 224	B									
30								B	U R 256	A	A	A	U R 308	U R 288	U R 268	A	A									
31																										
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								16	14	14	6	4	11	18	16	13	4									
MED								U 192	248	280	310	U R 302	U R 300	U R 288	U R 268	U R 240	U 192									
U Q								U R 202	U 260	U R 292	312	U R 312	312	U R 288	U R 272	U R 242	U 196									
L Q								188	244	272	304	294	U R 296	U A 284	U 266	U 230	182									

NOV. 2018 foE (0.01MHz)

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NOV. 2018 foEs (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

LAT.35°43.0'N LON.139°29.0'E SWEEP 1.0MHz TO 30.0MHz IN 15.0SEC IN MANUAL SCALING

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	20	22	E B 15	21	J A 21	20	21	23	29	34	J A 40	J A 49	J A 76	J A 44	G	29	G	J A 23	J A 23	E B 15	E B 15	E B 16	23	22
2	E B 16	E B 16	E B 15	E B 15	E B 16	E B 14	E B 15	G	J A 33	J A 34	G	G	G	36	G	G	25	J A 27	J A 44	25	J A 23	J A 36	J A 40	J A 24
3	E B 16	E B 14	E B 16	E B 15	E B 16	E B 16	E B 16	24	G	32	G	J A 44	J A 43	J A 51	37	32	J A 40	J A 44	J A 29	J A 30	J A 24	E B 16	E B 15	20
4	23	J A 25	21	20	J A 25	22	J A 26	G	30	32	J A 48	35	J A 36	J A 35	34	J A 36	J A 35	J A 29	J A 24	J A 50	J A 24	J A 24	24	23
5	E B 16	19	24	23	23	E B 15	E B 16	E B 15	J A 34	J A 44	J A 55	J A 48	G	G	G	G	21	J A 20	E B 16	J A 22	24	J A 36	J A 35	J A 30
6	22	J A 26	21	J A 32	J A 26	22	20	J A 26	J A 35	35	J A 41	J A 42		G	J A 36	J A 36	J A 42	J A 36	22	E B 16	J A 24	25	J A 31	J A 36
7	J A 51	J A 33	J A 31	J A 30	22	E B 16	E B 16	25	28	J A 37	J A 35	G	G	G	G	27	G	E B 16	E B 16	E B 16	E B 16	E B 16	E B 15	E B 16
8	21	J A 46	J A 28	E B 17	J A 26	J A 22	20	J A 26	31	J A 41	J A 43	35	31	G	30	J A 51	J A 46	E B 16	E B 16	E B 23	J A 26	E B 16	E B 16	E B 16
9	E B 16	J A 26	J A 26	24	J A 23	J A 19	19	24	27	34	G	J A 64	J A 52	34	J A 46	J A 33	J A 31	J A 32	J A 27	J A 28	J A 31	E B 17	J A 30	J A 47
10	J A 28	J A 37	J A 32	J A 24	J A 24	20	E B 16	G	J A 34	J A 41	J A 38	J A 48	J A 47	G	30	J A 36	J A 28	J A 33	J A 29	J A 36	J A 22	J A 41	J A 26	J A 28
11	22	E B 15	E B 15	20	22	20	E B 16	25	31	J A 52	J A 63	J A 50	J A 35	J A 34	G	28	J A 25	J A 22	J A 22	J A 42	E B 16	22	J A 54	J A 34
12	J A 25	J A 33	J A 36	24	22	J A 23	E B 17	29	31	J A 34	J A 35	J A 48	J A 37	J A 34	J A 32	J A 34	25	19	E B 16	E B 15	21	E B 16	J A 27	J A 32
13	J A 23	J A 24	J A 24	J A 25	22	J A 34	J A 21	G	G	J A 37	J A 45	J A 40	G	32	G	G	22	E B 16	E B 16	E B 15	E B 16	E B 16	E B 16	E B 16
14	E B 16	E B 16	E B 16	E B 16	E B 17	E B 16	E B 16	23	29	34	38	J A 50	38	35	G	28	22	E B 16	24	E B 17	E B 16	E B 16	E B 16	E B 16
15	E B 16	E B 16	E B 15	E B 15	E B 16	E B 16	E B 15	G	J A 29	33	G	G	G	G	32	G	J A 24	J A 22	20	J A 24	23	E B 16	22	22
16	E B 16	E B 16	E B 16	E B 15	E B 16	E B 14	E B 15	23	28	34	G	G	G	G	32	J A 46	21	E B 16	E B 15	J A 32	J A 36	23	J A 31	J A 36
17	J A 27	E B 16	21	21	E B 16	E B 16	E B 16	20	32	34	35	J A 35	36	33	J A 42	J A 40	J A 33	J A 77	J A 32	23	J A 24	J A 30	E B 16	J A 28
18	J A 25	J A 24	E B 16	E B 16	22	22	E B 16	25	30	J A 40	J A 38	G	G	33	J G 27	J A 35	22	J A 50	22	22	E B 16	J A 36	E B 16	E B 16
19	E B 15	E B 16	E B 16	20	E B 16	E B 16	23	22	G	G	G	G	G	G	32	G	20	22	E B 16	E B 16	E B 15	J A 22	J A 26	J A 33
20	20	22	23	E B 16	E B 16	E B 16	E B 15	G	J A 34	G	G	J A 37	J A 50	J A 43	J A 45	J A 30	J A 26	J A 24	20	E B 16	E B 16	E B 16	E B 15	E B 15
21	E B 16	E B 16	22	E B 16	E B 16	E B 16	E B 15	22	27	31	G	38	35	36	32	32	27	E B 16	24	J A 26	J A 23	23	E B 16	20
22	22	J A 25	22	21	E B 17	22	20	21	28	G	G	34	G	34	31	G	24	E B 16	22	E B 16	E B 15	E B 15	E B 16	E B 16
23	E B 16	E B 16	20	E B 16	E B 15	22	J A 22	J A 23	30	33	37	34	J A 35	G	J A 30	G	E B 16	21	J A 22	E B 16	E B 15	E B 16	E B 16	E B 16
24	E B 16	E B 16	E B 16	E B 15	E B 16	E B 16	E B 16	25	31	34	37	G	G	33	G	28	26	E B 16	E B 15	J A 23	E B 16	E B 18	E B 15	E B 15
25	E B 15	J A 24	J A 28	21	20	20	J A 22	E B 17	G	36	40	33	34	34	G	J A 36	J A 30	J A 35	J A 39	J A 33	J A 24	J A 32	J A 27	J A 46
26	J A 33	J A 37	21	J A 34	J A 21	20	20	21	G	32	34	35	36	33	G	29	21	E B 16	E B 16	21	E B 16	E B 16	E B 17	E B 17
27	E B 16	E B 16	19	E B 16	E B 16	E B 16	19	20	31	31	32	35	G	35	33	28	J A 42	J A 56	J A 37	C	23	J A 27	J A 27	J A 31
28	22	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 15	J A 28	J A 33	J A 37	J A 36	J A 43	J A 36	J A 45	J A 35	J A 28	J A 26	J A 33	J A 37	J A 33	J A 38	J A 33	J A 48
29	J A 24	J A 23	21	E B 16	20	E B 16	E B 16	22	G	G	J A 37	G	G	G	G	25	E B 15	20	23	J A 42	J A 48	J A 34	J A 36	J A 26
30	J A 27	21	21	E B 16	E B 16	E B 15	E B 15	E B 15	G	J A 37	J A 36	J A 39	G	G	G	J A 36	J A 25	22	E B 16	E B 16	E B 16	22	22	E B 16
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	30	30	30	30	30	30	29	30	30	30	30	30	30	29	30	30	30	30
MED	20	22	21	18	18	E B 16	E B 16	22	29	34	36	35	34	33	30	30	25	J A 22	22	23	22	22	22	22
U Q	J A 24	J A 25	J A 24	J A 23	J A 22	22	20	24	J A 31	J A 37	J A 40	J A 44	J A 38	J A 35	J A 33	J A 36	J A 30	J A 32	J A 27	J A 31	J A 24	J A 30	J A 30	J A 32
L Q	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	G	G 27	32	G	G	G	G	G	G 25	21	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16

NOV. 2018 foEs (0.1MHz)

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IONOSPHERIC DATA STATION Kokubunji

NOV. 2018 fbEs (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

LAT.35°43.0'N LON.139°29.0'E SWEEP 1.0MHz TO 30.0MHz IN 15.0SEC IN MANUAL SCALING

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	E B 15	E B 16	E B 15	E B 16	E B 16	E B 16	E B 16	22	27	32	36	42	34	30	G	27	G	E B 15	E B 16	E B 15	E B 15	E B 16	E B 16	E B 15
2	E B 16	E B 16	E B 15	E B 15	E B 16	E B 14	E B 15	G	25	29	G	G	G	34	G	G	23	E B 16	24	E B 15	E B 16	E B 16	19	E B 16
3	E B 16	E B 14	E B 16	E B 15	E B 16	E B 16	E B 16	22	G	30	G	35	32	36	35	30	34	36	21	E B 16	E B 16	E B 16	E B 15	E B 17
4	E B 16	18	E B 16	E B 16	E B 16	E B 16	18	G	28	32	38	32	32	29	32	28	22	25	17	E B 16	E B 16	E B 16	E B 16	E B 16
5	E B 16	E B 16	E B 16	E B 16	E B 16	E B 15	E B 16	E B 15	30	34	35	39	G	G	G	G	19	E B 16	E B 16	16	E B 16	22	E B 16	25
6	E B 16	18	E B 16	E B 16	E B 16	E B 16	E B 16	22	26	33	35	32		G	28	26	34	17	E B 16	E B 16	E B 15	E B 15	18	19
7	E B 16	18	17	23	E B 16	E B 16	E B 16	23	26	30	29	G	G	G	G	27	G	E B 16	E B 16	E B 16	E B 16	E B 16	E B 15	E B 16
8	E B 16	20	20	E B 17	18	E B 16	17	22	26	36	35	32	30	G	29	44	35	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16
9	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	22	26	29	G	46	40	32	30	25	20	E B 16	18	E B 15	E B 16	E B 17	E B 16	E B 16
10	E B 16	E B 15	E B 16	E B 16	E B 16	E B 15	E B 16	G	28	35	31	33	35	G	29	31	22	21	E B 16	E B 15	E B 16	E B 15	E B 16	19
11	E B 16	E B 15	E B 15	E B 15	E B 15	E B 16	E B 16	21	25	44	31	33	29	31	G	24	20	E B 16	19	A A 42	E B 16	E B 16	E B 16	23
12	E B 16	20	21	E B 16	E B 15	16	E B 17	26	30	G 25	30	34	G 25	27	24	G 20	22	E B 16	E B 16	E B 15	E B 17	E B 16	E B 16	E B 17
13	E B 16	20	E B 16	E B 16	E B 16	17	E B 15	G	G	27	31	33	G	32	G	G	20	E B 16	E B 16	E B 15	E B 16	E B 16	E B 16	E B 16
14	E B 16	E B 16	E B 16	E B 16	E B 17	E B 16	E B 16	22	29	32	36	36	35	33	G	26	20	E B 16	E B 16	E B 17	E B 16	E B 16	E B 16	E B 16
15	E B 16	E B 16	E B 15	E B 15	E B 16	E B 16	E B 15	G	24	31	G	G	G	G	30	G	19	E B 16	E B 15	E B 15	E B 16	E B 16	E B 15	E B 15
16	E B 16	E B 16	E B 16	E B 15	E B 16	E B 14	E B 15	21	26	32	G	G	G	G	31	30	20	E B 16	E B 15	16	17	E B 16	E B 16	17
17	17	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	18	30	32	33	31	34	31	29	29	30	A A 77	E B 17	E B 16	E B 17	21	E B 16	E B 17
18	E B 16	E B 15	E B 16	E B 16	E B 15	E B 15	E B 16	22	26	33	33	G	G	32	G 20	24	20	A A 50	E B 16	E B 16	E B 16	19	E B 16	E B 16
19	E B 15	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	20	G	G	G	G	G	G	30	G	17	E B 16	E B 16	E B 16	E B 15	E B 16	E B 17	E B 16
20	16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 15	G	23	G	G	30	35	36	28	22	19	20	E B 15	E B 16	E B 16	E B 16	E B 16	E B 15
21	E B 16	E B 16	E B 15	E B 16	E B 16	E B 16	E B 15	20	26	29	G	35	33	33	31	30	26	E B 16	E B 17	22	19	E B 16	E B 16	E B 16
22	E B 16	E B 16	E B 16	E B 17	E B 17	E B 16	E B 16	21	26	G	G	30	G	32	28	G	21	E B 16	E B 17	E B 16	E B 15	E B 15	E B 16	E B 16
23	E B 16	E B 16	E B 15	E B 16	E B 15	E B 16	20	17	28	31	33	32	31	G	27	G	E B 16	E B 16	E B 16	E B 16	E B 15	E B 16	E B 16	E B 16
24	E B 16	E B 16	E B 16	E B 15	E B 16	E B 16	E B 16	19	30	32	33	G	G	30	G	25	22	E B 16	E B 15	E B 16	E B 16	E B 18	E B 15	E B 15
25	E B 15	E B 16	E B 16	E B 16	E B 15	E B 15	E B 16	E B 17	G	35	36	32	33	32	G	23	21	21	24	18	E B 16	E B 16	E B 17	16
26	E B 16	E B 16	E B 16	E B 16	E B 15	E B 15	E B 16	20	G	31	30	34	32	31	G	26	20	E B 16	E B 16	E B 15	E B 16	E B 16	E B 17	E B 17
27	E B 16	E B 16	16	E B 16	E B 16	E B 16	E B 16	18	28	28	31	32	G	34	32	26	34	A A 56	A A 37	C	E B 17	E B 16	E B 16	E B 16
28	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 15	21	29	31	32	35	29	32	32	23	17	24	E B 16	E B 16	20	19	19
29	E B 16	E B 16	E B 15	E B 16	E B 15	E B 16	E B 16	18	G	G	29	G	G	G	G	24	E B 15	E B 16	E B 16	A A 42	E B 16	20	E B 16	E B 16
30	E B 16	E B 15	E B 17	E B 16	E B 16	E B 15	E B 15	E B 15	G	26	29	31	G	G	G	23	18	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	30	30	30	30	30	30	29	30	30	30	30	30	30	29	30	30	30	30
MED	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	20	26	31	31	32	29	30	28	25	20	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16
U Q	E B 16	16	16	E B 16	E B 16	E B 16	E B 16	22	28	32	33	34	34	32	30	28	23	20	17	16	E B 16	16	E B 16	17
L Q	E B 16	E B 16	E B 16	E B 16	E B 16	E B 15	E B 16	G	G 21	G 28	G	G	G	G	G	G	19	E B 16	E B 16	E B 15	E B 16	E B 16	E B 16	E B 16

NOV. 2018 fbEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

NOV. 2018 fmin (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

LAT.35°43.0'N LON.139°29.0'E SWEEP 1.0MHz TO 30.0MHz IN 15.0SEC IN MANUAL SCALING

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	15	16	15	16	16	16	16	14	14	16	17	14	18	16	14	14	15	15	16	15	15	16	16	15
2	16	16	15	15	16	14	15	14	14	15	15	14	15	16	14	12	14	16	16	15	16	16	16	16
3	16	14	16	15	16	16	16	14	15	15	14	16	20	17	17	15	16	16	16	16	16	16	15	17
4	16	15	16	16	16	16	16	14	14	17	21	15	16	15	17	15	15	16	16	16	16	16	16	16
5	16	16	16	16	16	15	16	15	15	14	16	16	16	15	17	15	14	16	16	15	16	16	16	16
6	16	16	16	16	16	16	16	16	16	17	15	14		13	13	15	14	16	16	16	15	15	15	16
7	16	15	16	16	16	16	16	14	16	13	15	15	16	15	14	15	13	16	16	16	16	16	15	16
8	16	16	15	17	16	16	17	15	15	14	13	14	14	18	18	16	16	16	16	16	16	16	16	16
9	16	16	16	16	16	16	16	15	15	16	14	16	16	15	15	12	15	16	15	16	16	17	16	16
10	16	15	16	16	16	15	16	15	14	15	15	18	16	16	15	15	15	16	16	15	16	15	16	15
11	16	15	15	15	15	16	16	15	14	16	16	14	18	16	16	15	15	16	15	15	16	16	16	17
12	16	16	16	16	15	16	17	15	14	13	16	15	16	13	11	14	14	16	16	15	17	16	16	17
13	16	16	16	16	15	16	16	14	14	14	12	13	15	16	16	13	14	16	16	15	16	16	16	16
14	16	16	16	16	17	16	16	14	16	12	16	14	14	14	15	16	15	16	16	17	16	16	16	16
15	16	16	15	15	16	16	15	16	14	15	15	16	15	14	14	13	15	16	15	15	16	16	15	16
16	16	16	16	15	16	14	15	14	14	14	15	15	14	16	15	16	16	16	15	16	16	16	16	16
17	14	16	16	16	16	16	16	16	14	16	14	15	15	14	17	14	15	16	17	16	17	16	16	17
18	16	15	16	16	15	15	16	14	14	14	15	13	16	15	16	14	15	15	16	16	16	16	16	16
19	15	16	16	16	16	16	16	15	14	15	16	15	16	19	16	16	16	16	16	16	15	16	17	16
20	16	16	16	16	16	16	15	14	13	14	15	14	14	15	15	15	14	15	15	16	16	16	15	15
21	16	16	15	16	16	16	15	14	14	15	18	16	13	15	16	15	16	16	17	16	15	16	16	16
22	16	16	16	17	17	16	16	15	15	14	15	17	18	16	15	15	16	16	17	16	15	15	16	16
23	16	16	15	16	15	16	16	16	14	14	16	16	16	16	14	14	16	16	16	16	15	16	16	16
24	16	16	16	15	16	16	16	16	15	14	15	16	15	14	16	16	16	16	15	16	16	18	15	15
25	15	16	16	16	15	15	16	17	16	15	15	14	15	16	15	15	15	16	16	16	16	16	17	16
26	16	16	16	16	15	16	16	15	15	15	14	16	18	15	16	17	12	16	16	15	16	16	17	17
27	16	16	16	16	16	16	16	15	16	16	16	16	16	14	15	17	16	16	16	C	17	16	16	16
28	16	16	16	16	16	16	16	15	14	14	15	14	14	14	15	13	15	15	16	16	16	16	16	16
29	16	16	15	16	15	16	16	16	16	17	15	17	16	16	14	13	15	16	16	16	16	16	16	16
30	16	15	17	16	16	15	15	15	15	15	15	15	16	16	15	16	14	16	16	16	16	16	16	16
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	30	30	30	30	30	30	29	30	30	30	30	30	30	29	30	30	30	30
MED	16	16	16	16	16	16	16	15	14	15	15	15	16	15	15	15	15	16	16	16	16	16	16	16
U Q	16	16	16	16	16	16	16	15	15	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
L Q	16	16	15	16	15	16	16	14	14	14	15	14	15	14	14	14	14	16	16	15	16	16	16	16

NOV. 2018 fmin (0.1MHz)

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IONOSPHERIC DATA STATION Kokubunji

NOV. 2018 M(3000)F2 (0.01) 135°E MEAN TIME (G.M.T. + 9 H)

LAT.35°43.0'N LON.139°29.0'E SWEEP 1.0MHz TO 30.0MHz IN 15.0SEC IN MANUAL SCALING

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	334	324	321	343	352	351	395	419	381	366	392	381	376	367	373	387	383	384	355	319	334	352	320	317
2	332	336	335	337	351	370	366	397	389	372	381	366	393	366	392	390	372	359	282	337	337	332	334	332
3	334	319	323	336	339	F	383	400	392	397	386	350	367	380	376	370	395	388	402	322	328	319	328	336
4	333	333	355	329	381	371	378	397	392	371	353	372	379	345	398	383	397	388	359	356	340	331	330	282
5	F	321	310	348	334	338	338	351	413	357	343	355	355	377	349	374	354	361	319	362	318	310	289	377
6	289	312	304	294	300	403	345	349	367	372	361	365		370	368	384	373	350	375	305	324	346	343	323
7	333	343	331	333	338	372	368	390	384	356	352	372	371	351	359	373	378	394	362	333	331	335	325	299
8	324	303	325	354	340	358	359	373	379	378	390	410	385	349	341	373	377	402	404	314	313	318	312	278
9	311	350	336	345	355	366	344	381	385	358	375	367	360	348	371	384	390	360	341	342	315	302		F	F
10	F	F	F	F	F	344	356	394	360	380	362	373	374	369	374	370	381	371	368	324	326	328	319	316
11	344	347	321	333	343	352	368	417	401	385	378	375	335	V 365	353	398	372	359	370	A	356	329	310	316
12	F	F	F	305	F	F	371	383	384	389	385	361	351	361	362	374	399	368	342	329	357	343	333	323
13	330	326	313	329	371	334	359	395	386	387	393	376	349	377	359	383	392	378	364	347	326	338	322	322
14	350	341	329	319	371	396	389	401	387	380	341	369	369	375	383	423	382	374	379	318	349	367	319	335
15	313	291	358	352	353	337	362	404	389	399	393	362	359	342	353	377	391	346	342	346	372	366	339	323
16	F	F	F	344	331	340	382	415	398	383	385	392	389	343	381	398	396	390	373	359	336	330		F	328
17	330	326	312	312	328	359	350	415	417	383	370	377	378	383	386	335	385	A	355	338	347	373	312	328
18	301	320	325	317	315	F	370	393	379	358	365	389	364	325	368	394	382	A	355	323	337	320	316	315
19	310	307	315	342	353	389	339	386	389	368	374	375	365	379	369	366	369	389	362	369	355	324	373	305
20	294	297	286	299	332	346	F	393	381	348	389	339	407	389	370	368	371	391	344	344	363	350	337	324
21	336	342	293	332	389	436	354	378	383	381	391	383	372	378	381	374	386	368	345	357	346	320	297	302
22	296	318	313	320	353	339	361	373	397	376	363	375	363	377	368	389	403	389	324	376	347	344	330	304
23	F	F	310	331	342	F	F	389	382	378	360	V 334	362	351	374	356	397	399	361	374	331	336	356	F
24	F	F	F	F	F	390	F	392	398	380	370	388	380	384	379	400	401	355	347	367	368	343	375	F
25	F	F	F	F	F	347	367	407	404	391	338	370	362	352	379	395	392	372	398	387	311	354	314	343
26	328	324	346	317	367	349	342	376	406	339	392	358	381	397	398	377	393	353	357	352	333	341	325	319
27	315	288	293	331	342	372	385	374	372	390	382	409	355	383	370	360	391	A	A	C	S 364	F	322	F
28	329	359	347	325	321	346	350	380	399	379	360	396	360	381	383	392	392	360	362	316	329	324	336	289
29	F	F	F	296	340	334	345	376	387	378	368	374	363	378	382	373	395	352	366	A	316	392	324	299
30	F	326	317	326	324	337	350	396	405	401	371	373	344	367	399	377	377	391	381	367	337	330	342	276
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	21	23	24	27	26	26	27	30	30	30	30	30	29	30	30	30	30	27	29	27	30	29	28	26
MED	329	324	321	331	342	352	361	392	388	378	372	373	365	370	374	377	388	372	361	344	336	335	325	318
U Q	334	341	333	342	353	372	371	400	398	385	386	381	378	379	382	390	395	389	372	362	349	348	336	328
L Q	310	312	311	317	332	340	350	378	382	368	361	365	360	351	368	373	377	359	344	323	326	324	318	302

NOV. 2018 M(3000)F2 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

NOV. 2018 M(3000)F1 (0.01) 135°E MEAN TIME (G.M.T. + 9 H)

LAT.35°43.0'N LON.139°29.0'E SWEEP 1.0MHz TO 30.0MHz IN 15.0SEC IN MANUAL SCALING

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1											A	A	U L 425	U L 374	L									
2										L	L	U L 417	455	A		L								
3									L	L	L	U L 428	L	A	A									
4									L		A	U L 407	L	U L 383	A									
5								U L 422		L	U L 385	A	L	L	L									
6								L				424		L										
7									L	L	L	U L 442	L	L										
8										A	L	U L 428	L	L	L									
9										L	L	A	A	L	L									
10											L	L	A	L	L									
11									L	A	L	U L 408	U L 395							A				
12										L	L	L	L	L	L									
13										L	L	U L 426	U L 408											
14												A												
15											L	L	L	U L 389										
16										L	L	L	U L 447	U L 427		A								
17										A	L	U L 403			U L 414	L								
18										A	L	L		U L 381	L									
19										L	L	L	L	L	L									
20											L	U L 390		A										
21										L	L		L											
22										L	L	U L 405	L	U L 414		U L 426								
23								L		A	A	L	L	L										
24											U L 428	U L 417	U L 401		L									
25									L		A	417		L	U L 386									
26											U L 425	L	U L 425											
27										L	388		443	A										
28										L	U L 404	L	A	U L 398										
29									L	L	L	L	L	L										
30										L	L	L	L	L										
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								1			5	13	8	7	2	1								
MED								U L 422			U L 404	U L 417	U L 425	U L 389	U L 400	U L 426								
U Q											U L 426	U L 427	445	U L 414										
L Q											386	U L 406	U L 404	U L 381										

NOV. 2018 M(3000)F1 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

NOV. 2018 h'F2 (KM) 135°E MEAN TIME (G.M.T. + 9 H)

LAT.35°43.0'N LON.139°29.0'E SWEEP 1.0MHz TO 30.0MHz IN 15.0SEC IN MANUAL SCALING

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1											228	226	226	236	230									
2										230	228	218	212	232		216								
3									226	232	218	244	234	230	226									
4									222		268	236	216	260	232									
5								200		250	250	234	224	226	260									
6								242				254		234										
7									226	252	266	224	242	244										
8										234	222	224	236	258	264									
9										246	246	248	220	252	252									
10											244	228	228	224	228									
11									226	206	234	242	272							A				
12										228	232	244	264	232	242									
13										230	220	240	256											
14												214												
15											224	242	236	264										
16										230	224	222	222	250		220								
17										220	244	238			232	266								
18										238	238	224		284	240									
19										244	234	232	244	238	246									
20											224	260		216										
21										232	224		248											
22										224	234	230	228	234		196								
23								208		216	242	256	236	266										
24											244	216	244		244									
25									214		266	238	252	248	242									
26											222	236	226											
27										234	240		272	228										
28										236	260	214	228	238										
29									232	238	242	230	246	224										
30										224	254	242	286	236										
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								3	6	20	28	28	25	23	13	4								
MED								208	226	232	236	235	236	236	242	218								
U Q								242	226	238	245	242	250	252	249	243								
L Q								200	222	226	224	224	226	230	231	206								

NOV. 2018 h'F2 (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

NOV. 2018 h'F (KM) 135°E MEAN TIME (G.M.T. + 9 H)

LAT.35°43.0'N LON.139°29.0'E SWEEP 1.0MHz TO 30.0MHz IN 15.0SEC IN MANUAL SCALING

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	E B 256	E B 248	E B 274	E B 248	232	220	194	186	186	198	A	A	174	170	196	208	204	192	190	E B 244	E B 228	216	E B 234	E B 242
2	216	E B 236	E B 236	206	210	194	188	186	200	188	198	182	178	A	200	192	194	182	E A 240	202	214	E B 236	E B 236	228
3	E B 244	E B 244	E B 246	E B 246	222	186	186	188	190	200	188	182	182	A	A	204	196	214	192	222	E B 254	E B 244	E B 234	E B 252
4	E B 264	E A 246	204	208	200	182	206	196	186	222	A	184	184	180	A	210	204	194	180	206	208	E B 232	E B 232	E B 262
5	E B 258	E B 252	E B 238	222	212	E B 228	186	152	198	202	202	A	194	176	218	218	208	186	208	198	E B 236	E A 256	E B 278	212
6	E B 262	E A 260	E B 262	E B 248	E B 250	180	202	188	216	218	208	182		200	200	218	212	202	196	204	E B 256	228	232	E A 246
7	E B 256	E A 236	E A 250	E A 270	E B 236	208	202	206	190	192	176	176	192	190	208	216	200	194	194	210	E B 234	E B 232	E B 234	E B 250
8	E B 238	E A 286	E A 262	226	206	216	208	200	208	A	186	180	174	182	204	214	200	186	200	E B 264	E B 266	E B 248	E B 266	E B 276
9	E B 254	218	214	228	216	210	214	194	198	190	204	A	A	186	214	210	200	184	204	204	E B 236	E B 244	E B 234	E B 228
10	E B 234	E B 246	E B 244	242	198	E B 202	190	198	210	216	204	196	A	188	192	206	198	188	190	E B 244	E B 246	228	E B 232	E A 260
11	206	222	226	E B 242	E B 234	208	188	194	192	A	190	188	168	208	198	202	198	192	196	A	204	214	E B 238	E A 298
12	E B 240	E A 264	E A 272	E B 248	216	190	186	198	210	178	182	194	H 168	178	196	210	190	188	192	198	196	E B 252	E B 266	228
13	E B 236	E A 288	E B 256	E B 236	208	E A 236	208	200	200	186	180	188	176	214	194	202	196	190	E B 192	216	E B 228	E B 222	E B 240	E B 232
14	234	218	E B 242	212	222	192	208	182	198	198	216	A	230	226	214	190	208	194	180	E B 262	208	E B 206	E B 232	E B 250
15	E B 270	E B 282	E B 250	E B 232	E B 226	E B 224	202	196	188	198	170	176	174	196	216	208	196	204	204	212	206	E B 206	E B 212	E B 230
16	E B 252	E B 266	E B 238	224	E B 228	E B 240	190	184	194	198	196	196	172	160	218	A	188	188	190	204	E A 250	226	E B 244	E A 260
17	E A 266	E B 246	E B 246	E B 238	210	208	204	182	188	A	206	180	206	214	200	192	210	A	194	204	212	198	E B 244	E B 252
18	E B 268	E B 266	E B 266	E B 234	226	214	204	196	198	A	192	184	176	180	202	208	200	A	192	210	E B 224	222	E B 218	E B 238
19	E B 260	E B 250	E B 248	E B 242	E B 216	E B 196	216	190	202	188	196	198	196	192	204	206	198	184	206	198	204	226	200	E B 240
20	E B 260	232	E B 260	E B 254	E B 238	E B 234	208	190	190	196	194	178	208	A	202	196	204	186	198	210	202	210	E B 246	E B 256
21	228	212	E B 258	E B 250	196	186	204	202	196	194	188	212	214	220	204	212	202	184	194	212	222	224	E B 260	E B 246
22	E B 252	E B 252	E B 256	E B 242	E B 216	224	212	212	198	192	184	182	192	186	200	120	202	182	E B 230	198	200	226	E B 240	E B 288
23	E B 244	E B 232	E B 258	228	212	192	182	170	208	A	A	190	194	188	210	206	198	184	208	E B 192	E B 222	206	196	208
24	E B 242	E B 260	E B 244	E B 252	E B 240	202	176	170	192	202	186	174	176	210	202	204	200	188	206	210	196	208	190	E B 236
25	E B 282	E B 236	E B 268	E B 264	E B 232	218	192	188	180	208	A	186	202	204	190	208	204	202	212	200	E B 256	E B 238	E B 254	228
26	228	E B 246	234	E B 276	226	224	E B 230	192	198	200	198	196	186	200	196	214	200	184	E B 194	190	E B 220	192	228	E B 246
27	E B 244	E B 256	E B 252	E B 252	E B 236	200	210	196	208	204	204	204	184	A	228	218	212	A	A	C	202	E B 236	224	E B 258
28	E B 248	222	E B 236	E B 254	E B 252	218	226	200	202	198	192	188	A	196	208	206	200	196	228	222	E B 240	E A 262	E A 254	E A 300
29	E B 252	E B 284	E B 282	E B 238	E B 236	E B 234	E B 242	206	196	192	190	192	182	182	192	194	192	198	200	A	228	196	E B 274	E B 266
30	224	E B 234	E B 246	E B 242	E B 256	E B 236	E B 234	198	192	186	186	188	180	204	202	190	196	188	210	198	226	E B 234	216	E B 278
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	30	30	30	25	26	26	26	26	28	29	30	27	29	27	30	30	30	30
MED	E B 250	E B 246	E B 249	E B 242	U 214	202	203	194	198	198	192	187	183	191	202	206	200	188	195	205	U 210	U 214	E B 234	E B 248
U Q	E B 260	E B 260	E B 260	E B 250	E B 236	E B 224	210	198	202	202	202	194	194	204	209	211	204	194	207	E B 216	E B 236	E B 236	E B 246	E B 260
L Q	236	234	238	228	212	194	190	186	190	191	186	182	176	182	197	199	196	184	192	198	206	210	228	232

NOV. 2018 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

NOV. 2018 h'E (KM) 135°E MEAN TIME (G.M.T. + 9 H)

LAT.35°43.0'N LON.139°29.0'E SWEEP 1.0MHz TO 30.0MHz IN 15.0SEC IN MANUAL SCALING

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1							B	112	112	118	A	A	A	A	114	114	110	B						
2							B	112	A	A	112	110	110	112	114	114	114							
3							B	116	116	114	116	A	A	A	110	112	B							
4							B	122	114	112	A	A	A	A	114	A	A							
5							B	B	116	A	A	A	114	108	106	110	110							
6							B	118		112	A	A		108	A 108	A	A							
7							B	108	108	A	A	112	112	114	114	114	114							
8							B	A	114	A	A	A	A	116	116	A	A	B						
9							B	118	112	108	108	A	A	106	A	A	B							
10							B	114	116	112	A	A	A	110	110	A	B							
11							B	110	112	A	A	A	A	A	110	A	B			A				
12							B	110	112	114	A	A	108	A	A	106	112							
13							B	110	110	A	A	A	110	110	110	110	116							
14							B	114	116	112	112	A	108	108	112	112	B							
15							B	112	A	112	112	112	112	110	110	110	B							
16							B	110	108	114	114	114	110	110	110	A	B							
17							B	B	120	120	112	A	114	114	A	A	B							
18								112	A	A	A	112	112	110	108	A	A							
19							B	108	108	108	108	108	108	108	108	112	B							
20							B	116	A	118	114	A	A	A	A	A	A	B						
21							B	120	120	110	108	116	110	108	116	116	B							
22							B	B	112	112	112	112	114	106	108	108	B							
23							B	A	116	114	112	118	A	116	A	116	B							
24								B	116	116	112	112	112	108	112	118	120							
25							B	B	114	112	108	110	110	108	108	A	A	B						
26								110	114	114	116	118	112	114	116	110	112							
27								B	112	112	112	108	110	116	114	114	A							
28								B	A	A	A	A	A	A	A	A								
29								B	118	122	A	112	112	114	116	118	B							
30								B	120	A	A	A	124	112	112	A	A							
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								19	24	21	16	14	19	23	24	17	8							
MED								112	114	112	112	112	112	110	111	112	113							
U Q								116	116	115	113	114	112	114	114	115	115							
L Q								110	112	112	110	110	110	108	109	110	111							

NOV. 2018 h'E (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

NOV. 2018 h'Es (KM) 135°E MEAN TIME (G.M.T. + 9 H)

LAT.35°43.0'N LON.139°29.0'E SWEEP 1.0MHz TO 30.0MHz IN 15.0SEC IN MANUAL SCALING

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	92	84	B	84	88	88	88	134	140	120	106	102	96	96	G	142	G	108	102	B	B	B	94	86
2	B	B	B	B	B	B	B	G	98	98	G	G	G	140	G	G	132	110	100	96	96	96	94	92
3	B	B	B	B	B	B	B	140	G	148	G	104	98	88	138	128	114	106	102	100	98	B	B	92
4	90	88	86	84	84	86	86	G	150	132	102	98	96	104	126	104	110	102	102	100	96	102	102	100
5	B	96	98	94	94	B	B	B	126	100	98	96	G	G	G	G	114	90	B	90	94	94	92	92
6	92	92	92	94	94	94	102	98	104	148	94	94		G	92	104	104	96	96	B	96	96	94	94
7	94	92	88	88	88	B	B	146	124	96	96	G	G	G	G	118	G	B	B	B	B	B	B	B
8	92	92	92	B	92	92	90	86	124	100	96	96	96	G	114	104	100	B	B	110	100	B	B	B
9	B	90	90	90	90	90	90	148	148	118	G	102	92	160	86	94	88	90	90	92	94	B	94	88
10	94	88	92	88	92	88	B	G	122	108	98	96	94	G	126	100	100	98	94	94	96	88	88	86
11	90	B	B	88	86	94	B	118	118	102	98	98	90	98	G	104	100	100	94	90	B	90	90	90
12	90	90	90	90	90	90	B	132	130	88	88	88	88	88	88	86	104	88	B	B	92	B	98	98
13	86	86	82	88	92	92	92	G	G	96	92	90	G	156	G	G	136	B	B	B	B	B	B	B
14	B	B	B	B	B	B	B	156	146	148	146	84	160	144	G	132	142	B	98	B	B	B	B	B
15	B	B	B	B	B	B	B	G	100	156	G	G	G	G	130	G	88	88	82	96	98	B	92	92
16	B	B	B	B	B	B	B	134	122	162	G	G	G	G	142	82	124	B	B	98	100	100	98	90
17	88	B	88	88	B	B	B	106	142	142	126	100	114	132	106	102	102	96	96	98	98	100	B	90
18	90	92	B	B	92	102	B	142	106	96	94	G	G	140	88	88	92	90	90	96	B	96	B	B
19	B	B	B	88	B	B	88	154	G	G	G	G	G	G	164	G	114	86	B	B	B	92	96	96
20	98	94	94	B	B	B	B	G	102	G	G	98	86	86	86	82	82	84	84	B	B	B	B	B
21	B	B	92	B	B	B	B	132	146	162	G	158	142	132	114	138	130	B	128	118	112	112	B	94
22	92	92	92	88	B	88	88	134	126	G	G	116	G	148	132	G	120	B	88	B	B	B	B	B
23	B	B	92	B	B	90	92	86	144	142	116	122	104	G	102	G	B	88	88	B	B	B	B	B
24	B	B	B	B	B	B	B	138	118	126	122	G	G	140	G	116	122	B	B	100	B	B	B	B
25	B	98	90	90	80	80	86	B	G	140	144	124	134	124	G	90	90	90	86	84	88	96	94	92
26	92	90	90	90	108	92	92	148	G	140	132	128	116	128	G	154	142	B	B	90	B	B	B	B
27	B	B	86	B	B	B	86	96	146	134	134	130	G	144	126	152	84	84	84	C	84	88	92	92
28	98	B	B	B	B	B	B	B	102	98	96	96	94	94	94	90	90	90	96	96	96	86	94	94
29	88	88	88	B	124	B	B	114	G	G	106	G	G	G	G	112	B	100	100	98	96	96	94	94
30	92	96	88	B	B	B	B	B	G	102	104	104	G	G	G	108	94	92	B	B	B	94	94	B
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	17	17	19	15	15	14	12	20	23	26	21	22	16	19	18	23	26	21	20	18	17	16	17	19
MED	92	92	90	88	92	90	89	134	124	123	102	99	96	132	114	104	104	90	95	96	96	96	94	92
U Q	93	93	92	90	94	92	92	144	144	142	124	116	115	144	130	128	122	100	100	100	98	98	95	94
L Q	90	88	88	88	88	88	87	110	106	100	96	96	93	96	92	90	92	88	88	92	94	91	92	90

NOV. 2018 h'Es (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

NOV. 2018 TYPES OF Es 135°E MEAN TIME (G.M.T. + 9 H)

LAT.35°43.0'N LON.139°29.0'E SWEEP 1.0MHz TO 30.0MHz IN 15.0SEC IN MANUAL SCALING

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	F1	F2		F1	F2	F1	L2	H2	H1	C1	L2	L2	L2	L1		H1		L1	F1				F2	F1
2									L2	L1				H1			H1	L2	F3	F1	F1	F2	F3	F2
3								H1		H1		L1	L2	L3	H2	C2	C3	F4	F3	F2	F2			F2
4	F2	F3	F2	F1	F3	F3	L2		H2	H1	L2	L1	L2	L2	CL12	L1	L3	F3	F2	F2	F1	F2	F1	F1
5		F1	F2	F3	F1				C2	L3	L2	L3					C2	F1		F1	F1	F3	F2	F2
6	F2	F4	F1	F2	F2	F3	L1	L3	L4	HL23	L3	L2			L1	L2	L3	F2	F2		F2	F2	F3	F3
7	F3	F5	F3	F4	F2			H2	C2	L2	L2					C2								
8	F2	F4	F5		F4	F3	L2	L3	C1	L3	L2	L1	L2		C1	L3	L5			F1	F1			
9		F4	F3	F2	F3	F2	L1	H2	H1	C1		L2	L3	H1	L2	L2	L2	F2	F2	F2	F2		F2	F3
10	F2	F2	F2	F2	F2	F1			C2	C4	L2	L2	L2		C1	L2	L3	F2	F1	F2	F2	F2	F2	F3
11	F2			F1	F1	F2		C3	C2	L5	L2	L2	L1	L1		L1	L3	F1	F2	F6		F1	F3	F4
12	F1	F2	F3	F1	F1	F1		H3	C3	L2	L3	L2	L2	L3	L3	L2	CL12	F1			F1		F2	F2
13	F2	F2	F2	F2	F1	F2	L3			L2	L2	L2		H1			C2							
14								H1	H2	HL22	H2	L3	H1	H1		H1	H2		F1					
15									L2	H1					H1		L2	F1	F1	F3	F1		F3	F2
16								C2	C2	H1					H2	L4	CL22			F3	F5	F2	F2	F4
17	F2		F2	F2				L1	H2	H2	C1	L2	C1	C2	L2	L4	L4	F5	F3	F2	F3	F2		F2
18	F2	F2			F2	F1		H2	L2	L4	L2			H1	L1	L3	L1	F5	F1	F2		F3		
19				F1			L1	H2							H1		C1	F1				F3	F1	F2
20	F2	F1	F2						L2			L1	L3	L2	L2	L2	L2	L2	F1					
21			F2					CL11	H2	H1		H1	H1	C2	C3	C2	H2		F2	F6	F5	F1		F2
22	F2	F2	F2	F2		F2	L1	H2	C2			C1		H2	C1		C2		F1					
23			F1			F1	L3	L1	H3	H2	C1	C1	L2		L1			F1	F2					
24								H1	C3	C3	C2			H1		C3	C3			F1				
25		F2	F2	F2	F2	F1	L1			H2	H2	C2	H1	C1		L2	L2	L3	F4	F4	F3	F2	F2	F3
26	F4	F3	F2	F2	F1	F2	F2	H2		H2	C2	C1	C1	C1		H2	H1			F1				
27			F1				F1	L2	H3	C2	C2	H1		H2	C2	HL22	L3	F5	F4		F1	F2	F2	F2
28	F1								L3	L2	L2	L2	L3	L2	L3	L5	L3	F1	F6	F4	F3	F7	F4	F4
29	F2	F2	F1		F1			C2			L2					C2		F1	F1	F8	F3	F4	F3	F2
30	F2	F1	F2							L2	L2	L2				L2	L2	F1				F1	F2	
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT																								
MED																								
U Q																								
L Q																								

NOV. 2018 TYPES OF Es

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

NOV. 2018 fxI (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

LAT.31°12.0'N LON.130°37.0'E SWEEP 1.0MHz TO 30.0MHz IN 15.0SEC IN MANUAL SCALING

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	X 32	X 33	X 31	X 36	X 34	X 36														X 37	X 39	X 41	X 45	X 38
2	X 36	X 37	X 37	X 39	X 40	X 33													X 49	X 35	X 39	X 39	X 40	X 39
3	X 38	X 38	X 37	X 36	X 35	X 38														X 34	X 34	X 36	X 37	X 38
4	X 38	X 37	X 37	X 39		X 34														X 34	X 39	X 38	X 37	X 36
5	X 38	X 37	41	X 37	X 36	X 27														X 40	X 40	X 42	X 42	X 42
6	X 34	X 36	X 35	X 38	X 36	X 35														X 38	X 40	X 44	X 45	A
7	X 34	X 35	X 34	X 32	X 33	X 28														X 32	X 33	X 38	X 38	X 38
8	X 38	X 38	X 37	X 38	X 38	X 25														X 32	X 36	X 37	X 38	X 35
9	X 36	X 37	X 37	X 36	X 45	X 31														X 30	X 34	X 36	X 38	X 35
10	X 41	X 37	X 36	35	X 41	A	39													A	A	X 40	X 40	X 33
11	X 39	X 36	X 37	X 35	X 35	X 34														A	A	X 34	X 33	X 38
12	X 37	44	40	41	41	39	29													X 36	X 34	X 37	X 32	X 37
13	X 35	X 34	X 36	X 37	X 38	X 34														X 32	X 32	X 36	X 36	X 37
14	X 36	39	39	X 33	36	X 36														X 34	X 34	X 40	X 31	X 34
15	X 33	X 33	X 31	X 33	X 33	X 36														X 40	X 36	X 40	X 41	X 32
16	X 33	X 32	X 32	31	32	X 28														X 34	X 31	X 34	X 34	X 34
17	32	X 34	35	X 32	X 34	X 33														X 38	X 36	X 40	X 35	X 32
18	X 34	X 35	X 34	X 32	X 36	X 27												X 50	X 40	X 41	X 38	X 39	X 43	X 34
19	X 35	X 35	X 33	X 33	X 39	X 27						C								X 38	X 34	X 37	X 36	X 36
20	X 34	X 35	X 35	X 34	X 34	X 32		X 46											X 39	X 36	X 40	X 34	X 32	X 33
21	X 36	X 35	X 34	X 33	X 37	X 28														X 42	X 33	X 33	X 33	X 33
22	X 33	40	40	38	X 37	40														X 30	X 34	X 34	X 31	X 31
23	X 34	X 36	X 36	X 35	X 38	X 38														X 32	X 34	X 36	X 36	X 32
24	X 33	39	45	48	50	57														X 35	X 35	X 34	X 31	X 30
25	36	36	35	34	X 34	X 33														X 38	A	X 30	X 31	X 31
26	X 31	X 31	X 28	X 29	X 29	X 30														A	X 32	X 34	36	33
27	X 33	X 33	X 33	X 33	X 33	X 33														X 32	X 34	O X 29	X 28	33
28	X 33	34	35	35	35	38														X 37	X 37	X 37	X 32	34
29	A	38	X 32	X 38	X 32	X 30														X 39	X 31	A	X 33	X 31
30	X 38	X 32	X 30	X 30	X 30	X 29														X 31	X 31	X 36	X 36	X 34
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	30	30	30	29	29	2	1										1	3	27	27	29	30	29
MED	X 35	X 36	X 35	X 35	X 36	X 33	34	X 46										X 50	X 40	X 35	X 34	X 37	X 36	X 34
U Q	X 38	37	37	X 38	X 38	36													X 49	X 38	X 38	X 40	X 38	X 37
L Q	X 33	X 34	X 33	X 33	X 34	X 28													X 39	X 32	X 33	X 34	X 32	X 32

NOV. 2018 fxI (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

NOV. 2018 foF2 (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

LAT.31°12.0'N LON.130°37.0'E SWEEP 1.0MHz TO 30.0MHz IN 15.0SEC IN MANUAL SCALING

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	26	27	25	30	28	30	22	44	49	52	63	76	59	54	70	67	68	50	39	31	33	35	39	32
2	30	31	31	33	33	26	25	44	48	60	66	79	66	58	61	60	48	53	43	29	33	33	34	33
3	32	32	31	30	29	32	23	44	56	54	62	66	63	60	54	61	60	49	36	28	28	30	31	32
4	32	31	31	33	33	28	24	45	47	48	54	61	62	53	55	65	64	48	37	28	33	32	31	30
5	32	31	F	31	31	21	22	45	50	60	60	74	81	60	64	83	70	62	38	34	34	36	36	36
6	28	30	29	32	30	30	27	48	53	60	59	72	71	67	56	64	56	50	40	32	33	38	39	A
7	28	29	28	28	27	22	21	43	51	60	64	80	72	56	61	60	53	48	33	26	27	32	32	32
8	32	32	31	32	32	19	22	44	59	71	75	64	59	53	57	79	68	57	34	26	30	30	32	29
9	30	31	31	30	39	25	18	41	50	56	58	72	60	60	76	71	60	49	30	24	28	30	32	29
10	35	31	30	F	35	A	F	52	50	58	60	76	66	66	85	77	66	48	A	A	A	34	34	27
11	33	30	31	29	29	28	27	45	56	53	55	65	69	92	86	61	54	57	A	A	A	28	27	32
12	31	F	F	F	F	F	F	40	51	49	55	63	68	70	64	81	62	53	41	30	28	31	26	31
13	29	28	30	30	32	28	28	46	60	57	56	62	59	64	70	61	63	52	38	26	26	30	31	31
14	30	F	F	27	F	30	20	40	50	53	57	54	59	57	69	61	52	48	41	28	28	34	25	27
15	27	27	25	27	27	30	22	42	52	55	57	60	56	51	59	70	55	45	32	34	30	33	35	26
16	27	26	26	F	F	22	25	42	54	56	62	60	53	55	62	69	69	53	40	28	25	28	28	28
17	F	28	F	26	28	27	21	38	46	50	48	60	54	52	59	55	62	52	40	32	30	34	29	25
18	28	29	28	26	30	21	22	40	46	54	57	68	60	57	70	66	62	44	34	35	32	33	37	28
19	29	29	27	27	33	21	22	39	50	55	63	C	53	53	59	58	55	44	33	32	28	31	30	30
20	28	29	29	28	28	26	26	40	48	52	69	62	66	58	64	63	54	63	33	30	34	28	26	27
21	29	29	28	27	31	22	20	36	48	53	59	66	63	59	63	53	50	47	37	36	26	27	27	27
22	27	F	F	F	31	F	24	43	57	62	62	64	72	67	60	62	51	44	34	24	28	28	24	25
23	28	30	30	29	32	32	26	34	47	50	61	58	54	57	59	57	49	52	30	26	28	30	30	26
24	27	F	F	F	F	F	33	40	54	52	58	63	62	59	52	59	46	45	33	29	29	27	25	24
25	F	F	F	F	28	27	26	36	49	50	59	62	60	60	59	49	59	45	34	32	A	24	25	25
26	25	25	22	23	23	24	20	33	47	59	52	64	60	53	49	56	54	50	33	A	26	28	F	F
27	27	27	27	27	27	27	24	34	47	50	59	66	52	54	47	55	50	50	34	26	28	23	22	F
28	27	F	F	F	F	F	20	35	56	48	60	65	58	58	56	60	45	41	38	31	31	31	26	F
29	A	F	26	32	26	24	F	36	59	56	57	57	60	61	50	56	48	43	40	33	25	A	27	25
30	32	26	24	24	24	23	21	38	48	45	50	55	68	59	61	52	45	42	35	25	25	30	30	28
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	27	23	22	23	25	25	27	30	30	30	30	29	30	30	30	30	30	30	28	27	27	29	29	26
MED	29	29	28	29	30	26	22	40	50	54	59	64	60	58	60	61	55	49	36	29	28	30	30	28
U Q	32	31	31	31	32	29	26	44	54	58	62	70	66	60	64	67	62	52	40	32	32	33	33	31
L Q	27	27	26	27	28	22	21	38	48	50	57	60	59	54	56	57	50	45	33	26	27	28	26	26

NOV. 2018 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

NOV. 2018 foF1 (0.01MHz) 135°E MEAN TIME (G.M.T. + 9 H)

LAT.31°12.0'N LON.130°37.0'E SWEEP 1.0MHz TO 30.0MHz IN 15.0SEC IN MANUAL SCALING

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1											L	L	L	U L 460	A	L								
2										L	U L 420	U L 412	404	L										
3										U L 464			444	408	392	A								
4											A	A	A	A	A									
5											L	416	L	L	L									
6											L	L	U L 396		L	L								
7										L	L	A	420		L	L								
8									L	L	L	L	U L 416	U L 416	U L 436									
9										L	L	U L 416	L	A	A									
10											L	L	L	U L 416	A	A		A	A					
11											A	A	A	L	L	A			A					
12											U L 416	U L 436	L	408	U L 400	A								
13											L	L	L		L									
14											U L 408	U L 468		U L 436										
15										L	L	U L 416	L		L									
16											L	L	L	L	L	A								
17												L	L	U L 416	L	L								
18										L	U L 404	U L 432	U L 432	L	A	L								
19										L	U L 420	C		L	L	L								
20											L	L	U L 420	U L 412	L	U L 396								
21										L	U L 400	L	L	U L 408	A	L								
22										L	404	420	424	424	L									
23											A	L	L	U L 476	A	L								
24											L	L	L	U L 420	L									
25									L		A	A	A	U L 416	L									
26									L	L	L	U L 404	L	U L 416		L								
27										L	U L 396	A	A	A										
28										L	U L 416	404	U L 404	L	L									
29										L	L	L	L	L	L	L								
30												U L 424	U L 420	L	L	L								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT										1	9	11	10	14	3	1								
MED										U L 464	U L 408	U L 416	U L 420	U L 416	U L 400	U L 396								
U Q											U L 418	U L 432	424	U L 424	U L 436									
L Q											U L 402	U L 412	U L 404	412	392									

NOV. 2018 foF1 (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

NOV. 2018 foE (0.01MHz) 135°E MEAN TIME (G.M.T. + 9 H)

LAT.31°12.0'N LON.130°37.0'E SWEEP 1.0MHz TO 30.0MHz IN 15.0SEC IN MANUAL SCALING

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1							B	U R 172	260		A	A	A	A	A	A	A	U R 236	B	B				
2							B	B	248	U A 280	A	U R 316	308	A	U A 300	U R 268	U R 236	U R 188						
3							B	U R 196	U R 252	U R 284	U A 308	A	U R 320	A	U R 316	300	U R 244	B	B					
4					A 396		B	B	U R 240	U A 268	U A 304	A	U A 320	U A 336	A	A	A	B	B					
5							B	B	U A 244	U R 284	U R 312	U R 312	A	U R 324	U A 296	U R 276	U R 232	U R 192	B					
6							B	B	U A 232	U A 280	A	A	U R 312	U A 312	A	A	U R 224	U R 192	B					
7							B	B	220	U A 264	U R 296	312	A	U R 312	A	U R 276	A	B	B					
8							B	184	252	A	A	A	A	A	A	A	A	A	B					
9							B	B	U A 220	A	A	A	A	A	A	A	A	A	B					
10							B	U A 168	U A 236	A	U R 300	A	A	A	A	A	A	A	B					
11							B	U R 176	U R 252	A	A	A	A	A	A	A	A	A	B					
12							B	B	U A 236	U A 284	A	A	U A 304	A	A	A	A	A	B					
13							B	B	U A 228	U R 276	A	U R 300	U R 308	308	A	U A 268	A	A	B					
14							B	B	232	268	U A 300	U R 308	308	U A 300	288	U A 264	U R 240	B	B					
15							B	B	A	U R 276	U A 296	R	308	304	U R 296	U A 272	220	B	B					
16							B	B	U R 224	A	A	A	R	U A 304	U A 288	A	U A 220	B	B					
17							B	B	U R 228	U A 288	U R 296	A	A	A	A	A	A	B	B					
18							B	B	U A 240	A	A	A	A	A	A	U R 268	A							
19							B	B	U R 224	U R 276	U R 300	C	A	U R 316	U R 288	276	U R 236	B	B					
20							B		U R 216	U A 268	288	U R 308	A	U R 316	A	A	U R 228	B						
21							B	B	U A 228	U A 280	292	U A 304	A	U A 312	U A 284	U R 272	236	B	B					
22							B	B	U R 232	300	U R 308	A	U R 316	U R 316	U R 328	U A 268	A	B	B					
23							B	B	212	A	A	A	A	A	A	A	A	B	B					
24							B	B	U R 240	A	U A 308	316	U A 316	A	A	A	U R 240	B	B					
25							B	B	U R 220	264	U A 288	300	A	A	U R 308	U R 276	240	B	B					
26							B	B	A	A	A	U R 312	312	U A 300	U A 280	U A 268	A	B	B					
27							B	B	U A 236	U A 260	U A 304	U A 304	U R 320	A	U A 300	A	A	B	B					
28							B	B	A	A	A	A	A	A	A	U R 272	A	B	B					
29							B	B	A	A	A	A	A	A	U R 292	A	A	A	B					
30							B	B	A	A	A	A	A	A	A	U R 268	A	B	B					
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT					1			5	25	17	15	11	12	13	13	15	13	3						
MED					A 396			U R 176	U 232	U A 276	U 300	U R 308	U 312	U 312	U 296	U R 272	U R 236	U R 192						
U Q								190	U 242	U 284	U 308	U R 312	U R 318	U R 316	U R 304	U R 276	U R 240	U R 192						
L Q								U 170	U R 224	U A 268	296	U 304	308	U A 304	U A 288	U A 268	U 226	U R 188						

NOV. 2018 foE (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

NOV. 2018 foEs (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

LAT.31°12.0'N LON.130°37.0'E SWEEP 1.0MHz TO 30.0MHz IN 15.0SEC IN MANUAL SCALING

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	E B 17	E B 15	E B 16	24	J A 26	E B 16	E B 16	G	G	37	39	J A 44	J A 44	J A 42	J A 47	J A 34	G	20	J A 28	J A 32	J A 31	J A 31	J A 23	23
2	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	22	28	32	35	G	G	J A 40	37	30	G	J A 26	J A 27	J A 28	J A 28	J A 26	J A 44	J A 26
3	J A 23	E B 16	21	21	E B 16	E B 15	E B 15	G	J A 30	G	36	38	G	J A 40	G	35	G	E B 16	G	E B 15	E B 15	E B 16	J A 22	E B 16
4	E B 16	J A 29	J A 40	J A 28	J A 36	20	21	G	29	36	40	J A 47	43	43	40	J A 38	J A 36	20	E B 14	J A 40	J A 33	J A 25	21	21
5	J A 28	E B 16	J A 26	E B 16	J A 23	E B 15	E B 16	J A 25	30	G	G	G	J A 38	G	34	G	G	G	E B 16	E B 15	E B 15	E B 16	E B 15	E B 16
6	20	19	19	E B 16	E B 16	E B 15	E B 15	20	30	32	34	J A 39	G	36	J A 34	J A 34	G	J A 26	J A 31	J A 24	21	J A 34	J A 42	J A 42
7	J A 35	J A 35	J A 25	22	J A 30	E B 16	E B 15	20	26	30	G	35	J A 39	J A 45	J A 56	G	28	J A 26	E B 16	E B 15	E B 15	E B 15	E B 15	J A 22
8	E B 16	22	E B 16	J A 33	J A 24	J A 24	22	J A 25	G	J A 43	34	36	37	J A 40	J A 36	J A 32	J A 35	J A 24	J A 22	J A 22	J A 23	E B 16	J A 28	21
9	20	20	E B 16	20	E B 16	20	E B 16	21	26	J A 31	33	34	J A 41	J A 70	J A 60	J A 66	J A 49	J A 26	23	J A 36	J A 35	22	J A 53	J A 40
10	J A 26	J A 36	J A 32	J A 48	J A 37	J A 45	J A 25	20	30	J A 37	34	34	J A 78	J A 47	J A 55	J A 57	J A 51	J A 53	J A 62	J A 54	J A 76	J A 54	J A 30	J A 23
11	J A 31	J A 27	23	J A 22	E B 16	19	E B 16	G	G	J A 39	J A 83	J A 79	J A 68	J A 52	J A 43	J A 61	J A 31	J A 48	J A 43	J A 48	J A 42	J A 32	J A 65	J A 35
12	J A 42	J A 50	J A 37	J A 29	E B 16	E B 25	E B 16	J A 34	29	31	J A 41	J A 39	36	J A 36	J A 41	J A 39	31	J A 35	J A 33	E B 20	J A 23	21	E B 16	20
13	J A 44	19	E B 15	E B 16	E B 24	J A 34	J A 30	18	G	G	J A 44	G	G	36	34	32	28	J A 27	J A 28	J A 34	23	J A 31	24	20
14	E B 16	21	E B 16	E B 16	E B 16	E B 16	E B 16	E B 15	27	32	33	G	36	G	33	35	G	20	E B 15	E B 15	E B 15	20	E B 15	E B 15
15	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	19	25	J A 30	G	34	34	38	35	35	31	27	E B 17	E B 15	J A 24	26	22	J A 22	E B 16
16	19	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	G	J A 30	31	J A 56	G	35	35	J A 46	30	J A 28	J A 31	J A 33	24	19	19	22
17	J A 34	J A 30	J A 26	J A 24	J A 28	J A 24	J A 24	E B 16	G	34	34	34	33	36	35	J A 38	J A 34	J A 23	23	J A 20	E B 16	E B 16	J A 33	E B 16
18	E B 16	J A 22	J A 22	J A 23	22	J A 26	J A 20	20	30	J A 39	J A 38	J A 88	J A 39	J A 44	J A 81	G	J A 32	J A 40	J A 24	E B 16	E B 16	E B 16	E B 16	E B 16
19	E B 16	E B 16	E B 16	E B 16	E B 16	E B 15	J A 27	E B 15	G	G	G	C	J A 36	G	G	G	G	20	E B 15	E B 15	20	E B 16	J A 22	E B 16
20	E B 16	E B 16	J A 25	E B 16	E B 16	E B 16	20	J A 21	J A 26	32	33	G	J A 39	G	32	J A 32	G	22	E B 16	22	E B 16	23	23	J A 30
21	J A 24	E B 15	E B 15	E B 15	E B 16	E B 16	E B 16	E B 16	29	32	34	35	36	38	36	G	27	E B 16	J A 27	J A 34	24	23	24	22
22	22	E B 16	E B 15	E B 16	22	22	22	22	G	31	G	34	G	G	J A 37	32	27	E B 18	E B 16	E B 16	E B 16	J A 22	19	E B 16
23	E B 16	E B 16	E B 15	E B 16	E B 16	22	E B 16	21	30	J A 43	38	J A 45	J A 42	J A 39	34	31	J A 27	20	J A 22	20	20	22	E B 16	E B 15
24	E B 16	E B 16	22	E B 16	E B 16	21	20	E B 17	G	32	36	37	40	38	32	J A 36	G	E B 16	E B 16	J A 38	J A 34	J A 34	19	J A 23
25	J A 31	E B 16	E B 16	J A 27	J A 32	J A 22	21	21	G	33	42	39	40	42	G	G	29	J A 22	21	21	J A 28	J A 22	J A 22	J A 28
26	J A 53	J A 24	J A 46	J A 51	J A 25	23	20	J A 24	J A 31	31	J A 36	G	37	34	33	30	J A 54	J A 31	J A 30	J A 32	24	J A 31	20	20
27	J A 33	J A 33	J A 23	J A 22	22	20	E B 16	E B 16	30	30	35	41	38	J A 47	36	34	29	J A 31	J A 25	J A 25	E B 16	B J 24	J A 28	J A 32
28	J A 30	J A 36	J A 24	J A 24	20	22	22	23	J A 29	J A 38	J A 36	J A 41	J A 42	J A 40	J A 46	J A 46	J A 28	E B 15	J A 38	J A 37	J A 27	J A 36	J A 24	J A 51
29	J A 51	J A 39	J A 26	J A 26	E B 16	25	J A 27	22	J A 29	J A 34	J A 36	J A 42	J A 38	J A 40	G	J A 37	J A 32	J A 34	J A 24	23	J A 22	J A 31	J A 51	J A 36
30	J A 52	J A 39	J A 26	E B 16	22	22	E B 16	19	J A 29	J A 35	J A 43	44	J A 61	J A 38	J A 40	G	J A 26	J A 26	22	20	22	J A 28	J A 33	22
31																								

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	30	30	30	30	30	29	30	30	30	30	30	30	30	30	30	30	30	30
MED	22	20	22	20	18	20	18	20	28	32	35	37	38	38	36	33	28	J A 24	J A 23	J A 24	23	22	J A 22	22
U Q	J A 33	J A 30	J A 26	J A 24	J A 24	J A 23	J A 22	22	30	J A 36	J A 38	J A 43	J A 41	J A 42	J A 41	J A 38	J A 32	J A 28	J A 28	J A 34	J A 28	J A 31	J A 30	J A 28
L Q	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	G	G	G 30	33	G 34	G 36	G 35	33	G 30	G	E B 20	E B 16	E B 20	E B 16	E B 19	E B 19	E B 16

NOV. 2018 foEs (0.1MHz)

IONOSPHERIC DATA STATION Yamagawa

NOV. 2018 fbEs (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

LAT.31°12.0'N LON.130°37.0'E SWEEP 1.0MHz TO 30.0MHz IN 15.0SEC IN MANUAL SCALING

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	E B 17	E B 15	E B 16	E B 16	E B 16	E B 16	E B 16	G	G	34	33	34	36	38	39	28	G	17	E B 16	19	E B 16	E B 16	E B 16	E B 15
2	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	21	28	30	31	G	G	31	34	29	G	19	22	20	18	18	22	E B 16
3	E B 16	E B 16	E B 16	E B 16	E B 16	E B 15	E B 15	G	G 20	G	34	34	G	32	G	33	G	E B 16	G	E B 15	E B 15	E B 16	E B 17	E B 16
4	E B 16	16	17	22	G 18	E B 16	E B 16	G	28	34	39	37	37	40	37	31	28	18	E B 14	E B 16	E B 16	E B 16	17	E B 16
5	E B 15	E B 16	16	E B 16	14	E B 15	E B 16	21	26	G	G	G	31	G	33	G	G	G	E B 16	E B 15	E B 15	E B 16	E B 15	E B 16
6	E B 16	E B 15	E B 15	E B 16	E B 16	E B 15	E B 15	20	26	30	32	32	G	34	29	30	G	18	24	E B 16	E B 16	E B 16	20	A A 42
7	20	17	E B 16	E B 16	E B 16	E B 16	E B 15	19	25	28	G	34	33	32	32	G	26	20	E B 16	E B 15	E B 15	E B 15	E B 15	E B 16
8	E B 16	E B 16	E B 16	18	E B 16	16	18	G 18	G	29	32	33	34	34	34	30	30	19	18	E B 16	17	E B 16	19	E B 16
9	E B 16	E B 16	E B 16	E B 16	E B 16	16	E B 16	19	25	28	32	32	32	38	41	37	24	22	16	18	18	E B 16	E B 16	18
10	E B 16	E B 16	E B 16	E B 16	20	A A 45	E B 16	18	29	31	32	32	32	32	35	30	24	38	A A 62	A A 54	A A 76	27	17	E B 16
11	19	18	E B 16	E B 16	E B 16	E B 17	E B 16	G	G	29	38	37	45	33	31	48	22	40	A A 43	A A 48	A A 42	20	23	21
12	22	16	20	E B 16	E B 16	E B 16	E B 16	19	25	29	30	33	35	33	30	31	29	22	20	E B 20	E B 16	E B 16	E B 16	16
13	E B 15	E B 15	E B 15	E B 16	E B 16	18	18	16	G	G	32	G	G	36	32	31	27	18	19	E B 16	E B 15	E B 15	E B 15	E B 15
14	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 15	26	30	32	G	35	G	32	33	G	19	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15
15	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	22	G	33	34	38	34	34	29	24	E B 17	E B 15	16	E B 15	E B 16	E B 16	E B 16
16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	G	26	30	36	G	34	34	36	27	22	21	21	18	E B 15	E B 15	E B 15
17	E B 16	E B 16	E B 16	17	E B 16	E B 16	E B 16	E B 16	G	32	33	32	32	34	32	32	31	18	E B 16	16	E B 16	E B 16	E B 16	E B 16
18	E B 16	E B 16	E B 16	16	E B 16	E B 16	E B 16	19	28	28	30	35	32	33	36	G	23	34	21	E B 16	E B 16	E B 16	E B 16	E B 16
19	E B 16	E B 16	E B 16	E B 16	E B 16	E B 15	E B 15	E B 15	G	G	G	C 32		G	G	G	G	19	E B 15	E B 15	E B 17	E B 16	E B 16	E B 16
20	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	G 18	31	32	G	34	G	30	30	G	20	E B 16	16	E B 16	16	E B 16	E B 16
21	E B 15	E B 15	E B 15	E B 15	E B 16	E B 16	E B 16	E B 16	26	31	34	34	36	36	34	G	26	E B 16	16	17	E B 16	E B 16	E B 16	E B 16
22	E B 17	E B 16	E B 15	E B 16	E B 16	E B 16	E B 16	16	G	G 27	G	32	G	G	G 26	32	25	E B 18	E B 16	E B 16	E B 16	18	E B 16	E B 16
23	E B 16	E B 16	E B 15	E B 16	E B 16	E B 16	E B 16	19	28	32	32	32	34	34	32	28	24	18	E B 15	E B 15	E B 15	E B 16	E B 16	E B 15
24	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 17	G	31	34	35	36	36	30	29	G	E B 16	E B 16	24	E B 16	E B 16	E B 15	E B 15
25	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	G	32	41	37	38	35	G	G	26	18	E B 16	16	A A 28	18	E B 15	E B 16
26	E B 16	E B 16	17	17	E B 16	17	E B 16	17	21	29	31	G	36	32	31	29	29	29	E B 16	A A 32	19	18	E B 16	E B 16
27	E B 16	E B 16	16	E B 16	E B 16	E B 16	E B 16	E B 16	28	28	33	38	35	36	33	32	27	22	E B 16	E B 16	E B 16	18	E B 16	E B 16
28	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	25	29	30	30	34	33	30	G 25	22	E B 15	33	18	18	E B 16	18	E B 16
29	A A 51	22	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	23	27	29	32	32	31	G	26	22	22	16	16	16	A A 31	19	E B 16
30	19	21	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	21	29	33	33	33	32	30	G	22	17	17	E B 16	E B 16	E B 16	E B 16	E B 16
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	30	30	30	30	30	29	30	30	30	30	30	30	30	30	30	30	30	30
MED	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	17	22	29	32	33	34	33	32	30	24	18	G	16	E B 16	E B 16	E B 16	E B 16
U Q	16	16	16	16	E B 16	16	E B 16	19	26	31	33	34	36	35	34	32	27	22	20	19	18	18	17	16
L Q	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	G	G 27	30	G 31	G 32	G 32	G 30	G	G	E B 18	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16

NOV. 2018 fbEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

NOV. 2018 fmin (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

LAT.31°12.0'N LON.130°37.0'E SWEEP 1.0MHz TO 30.0MHz IN 15.0SEC IN MANUAL SCALING

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	17	15	16	16	16	16	16	14	14	15	15	16	18	17	21	16	15	15	16	15	16	16	16	16
2	16	16	16	16	16	16	16	16	16	17	17	18	18	17	18	18	17	16	16	16	16	15	16	16
3	16	16	16	16	16	15	15	17	16	16	18	18	18	18	18	19	16	16	16	15	15	16	17	16
4	16	16	16	16	16	16	16	16	14	13	13	17	16	17	18	12	14	13	14	16	15	16	17	16
5	15	16	16	16	14	15	16	16	16	13	15	14	14	16	16	16	16	14	16	15	15	16	15	16
6	16	15	15	16	16	15	15	15	15	16	16	19	19	19	16	18	15	14	14	16	16	16	16	16
7	16	16	16	16	16	16	15	14	15	15	15	15	16	16	15	16	14	16	16	15	15	15	15	16
8	16	16	16	16	16	16	16	15	15	15	16	15	15	15	20	19	14	14	15	16	15	16	16	16
9	16	16	16	16	16	16	16	15	15	15	16	16	15	17	16	16	16	16	16	16	16	16	16	16
10	16	16	16	16	16	16	16	15	15	15	16	16	21	15	16	16	16	16	17	17	16	16	15	16
11	16	16	16	16	16	17	16	16	16	16	19	16	18	20	19	17	15	15	15	16	15	15	15	15
12	16	16	16	16	16	16	16	16	16	16	14	14	14	15	14	15	13	16	16	20	16	16	16	16
13	15	15	15	16	16	16	16	15	15	16	16	15	16	16	15	15	15	15	15	16	16	16	15	15
14	16	16	16	16	16	16	16	15	15	15	16	20	20	18	17	17	16	15	15	15	15	15	15	15
15	16	16	16	16	16	16	16	16	16	15	15	16	18	19	17	14	16	17	15	15	15	16	16	16
16	16	16	16	16	16	16	16	16	15	15	15	16	15	15	16	17	16	16	15	15	16	16	16	15
17	16	16	16	16	16	16	16	16	16	15	15	15	16	16	17	17	16	15	16	16	16	16	16	16
18	16	16	16	16	16	16	16	15	15	16	16	15	15	15	17	17	14	15	15	16	16	16	16	16
19	16	16	16	16	16	15	15	15	15	16	15	C	20	16	17	17	16	15	15	15	17	16	16	16
20	16	16	16	16	16	16	16	16	14	15	15	15	16	18	17	16	15	16	16	16	16	16	16	16
21	15	15	15	15	16	16	16	16	14	15	15	16	17	17	18	17	16	16	16	16	16	16	16	16
22	17	16	15	16	16	16	16	15	15	16	16	17	16	16	15	16	16	18	16	16	16	16	16	16
23	16	16	15	16	16	17	16	16	16	15	12	15	15	16	16	16	15	15	15	15	16	16	16	15
24	16	16	16	16	16	16	16	17	16	16	16	16	16	16	16	16	15	16	16	16	16	16	15	15
25	16	16	16	16	16	16	16	16	16	15	15	16	16	16	16	16	15	17	16	16	16	15	15	16
26	16	16	16	16	16	17	16	16	15	16	14	15	17	16	17	16	15	15	16	15	16	16	16	16
27	16	16	16	16	16	16	16	16	16	16	16	16	16	14	18	18	15	16	16	16	16	16	16	16
28	16	16	16	16	16	16	16	16	15	16	16	16	17	16	15	15	15	15	15	16	16	16	16	16
29	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	15	15	15	16	16	16	15	16	16
30	16	15	16	16	16	16	16	16	16	16	13	15	15	15	15	15	15	16	16	16	16	16	16	16
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	30	30	30	30	30	29	30	30	30	30	30	30	30	30	30	30	30	30
MED	16	16	16	16	16	16	16	16	15	16	16	16	16	16	16	16	15	16	16	16	16	16	16	16
U Q	16	16	16	16	16	16	16	16	16	16	16	16	18	17	18	17	16	16	16	16	16	16	16	16
L Q	16	16	16	16	16	16	16	15	15	15	15	15	15	16	16	16	15	15	15	15	15	16	15	16

NOV. 2018 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

NOV. 2018 M(3000)F2 (0.01) 135°E MEAN TIME (G.M.T. + 9 H)

LAT.31°12.0'N LON.130°37.0'E SWEEP 1.0MHz TO 30.0MHz IN 15.0SEC IN MANUAL SCALING

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	328	335	290	280	374	366	378	404	389	373	364	380	394	284	367	363	396	364	386	352	302	360	375	333
2	333	332	324	328	379	354	334	392	386	390	370	399	397	373	346	358	364	395	351	379	323	320	316	340
3	317	317	326	334	343	396	375	386	380	323	394	371	357	374	347	357	378	391	349	327	329	317	332	345
4	311	324	324	341	360	409	370	396	384	411	341	372	384	367	350	369	377	403	366	336	332	338	348	310
5	320	330	F	343	373	287	340	384	390	366	346	353	356	375	305	354	373	363	388	316	299	300	315	371
6	302	323	293	320	332	380	320	384	377	378	361	366	373	375	371	361	385	392	365	332	323	333	365	A
7	308	330	339	345	336	354	330	366	386	369	354	370	350	362	374	385	367	379	379	341	328	327	332	339
8	322	323	335	332	416	356	311	370	345	350	379	382	369	358	311	365	372	380	405	297	328	319	330	323
9	330	320	332	337	360	375	319	368	386	380	374	369	378	334	346	373	386	401	367	315	327	321	342	365
10	285	309	301	F	371	A	F	394	400	369	338	364	389	323	356	377	399	394	A	A	A	312	317	301
11	327	333	340	320	350	344	352	378	402	402	384	349	348	360	388	381	350	368	A	A	A	369	328	315
12	318	F	F	F	F	F	F	381	392	409	338	338	353	356	354	354	379	387	392	349	306	380	302	364
13	315	340	308	339	337	352	354	386	398	385	375	374	358	347	362	363	380	395	372	399	340	339	339	354
14	337	F	F	322	F	405	377	404	376	367	346	346	358	367	367	395	366	375	381	377	327	367	360	342
15	325	309	298	345	346	376	350	376	417	380	398	383	368	346	355	394	401	388	364	382	345	348	387	343
16	323	315	315	F	F	366	374	395	411	385	400	387	372	359	356	379	381	392	350	358	317	334	312	313
17	F	313	F	324	309	405	388	401	409	386	390	350	369	360	396	372	357	366	357	367	322	359	362	332
18	336	351	307	329	384	324	379	391	402	372	359	381	357	355	364	364	397	398	357	354	319	358	377	332
19	323	329	327	326	387	416	340	378	365	355	357	C	383	372	359	350	400	399	357	385	310	360	313	369
20	316	317	318	307	283	311	339	410	376	357	369	337	369	369	354	355	406	377	386	347	348	354	334	321
21	336	345	291	310	323	423	398	385	367	365	363	349	360	353	407	359	399	406	362	378	352	323	296	272
22	298	F	F	F	308	F	319	378	381	355	362	351	371	343	353	395	363	388	352	366	339	344	332	311
23	310	320	320	328	388	384	395	373	376	360	377	375	371	286	368	382	394	401	402	359	361	328	385	361
24	344	F	F	F	F	F	388	379	399	360	374	364	335	365	353	396	379	390	378	335	345	365	339	310
25	F	F	F	F	342	372	394	387	384	362	352	387	368	380	365	379	384	385	367	366	A	328	362	343
26	343	307	319	337	337	370	416	372	388	403	379	372	358	369	356	365	378	393	387	A	358	310	F	F
27	327	341	341	337	315	381	420	366	379	365	381	392	390	328	369	366	370	389	388	366	394	321	313	F
28	332	F	F	F	F	F	378	373	395	379	365	391	356	385	349	409	382	379	361	361	324	331	387	F
29	A	F	351	337	318	313	F	362	388	394	383	383	367	390	365	382	371	382	367	384	330	A	306	308
30	331	357	335	335	325	349	355	390	408	415	371	339	389	364	389	377	395	374	378	366	371	346	346	360
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	27	23	22	23	25	25	27	30	30	30	30	29	30	30	30	30	30	30	28	27	27	29	29	26
MED	323	324	322	332	343	370	370	384	387	372	370	371	368	361	358	370	380	388	367	359	328	334	334	336
U Q	332	335	335	337	374	390	388	392	399	386	379	382	378	372	368	382	395	395	386	377	345	358	362	354
L Q	315	317	307	322	324	350	339	373	379	362	357	350	357	347	353	361	371	379	359	336	322	321	316	313

NOV. 2018 M(3000)F2 (0.01)

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NOV. 2018 M(3000)F1 (0.01) 135°E MEAN TIME (G.M.T. + 9 H)

LAT.31°12.0'N LON.130°37.0'E SWEEP 1.0MHz TO 30.0MHz IN 15.0SEC IN MANUAL SCALING

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1											L	L	L	U L 380	A	L								
2										L	U L 392	U L 406	429	L										
3										U L 379			396	431	437	A								
4											A	A	A	A	A									
5											L	393	L	L	L									
6											L	L	U L 445		L	L								
7										L	L	A	421		L	L								
8									L	L	L	L	U L 414	U L 416	U L 374									
9										L	L	U L 402	L	A	A									
10											L	L	L	U L 411	A	A		A	A					
11											A	A	A	L	L	A			A					
12											U L 419	U L 401	L	414	U L 393	A								
13											L	L	L		L									
14											U L 410	U L 399		U L 379										
15										L	L	U L 411	L		L									
16											L	L	L	L	L	A								
17												L	L	U L 404	L	L								
18										L	U L 404	U L 403	U L 421	L	A	L								
19										L	U L 373	C		L	L	L								
20											L	L	U L 413	U L 411	L	U L 384								
21										L	U L 399	L	L	U L 417	A	L								
22										L	420	409	383	406	L									
23											A	L	L	U L 358	A	L								
24											L	L	L	U L 412	L									
25									L		A	A	A	U L 386	L									
26									L	L	L	U L 423	L	U L 404		L								
27										L	U L 402	A	A	A										
28										L	U L 384	392	U L 421	L	L									
29										L	L	L	L	L	L	L								
30												U L 402	U L 397	L	L	L								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT										1	9	11	10	14	3	1								
MED										U L 379	U L 402	U L 402	U L 418	U L 408	U L 393	U L 384								
U Q											U L 414	U L 409	U L 421	414	437									
L Q											U L 388	399	397	U L 386	U L 374									

NOV. 2018 M(3000)F1 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

NOV. 2018 h'F2 (KM) 135°E MEAN TIME (G.M.T. + 9 H)

LAT.31°12.0'N LON.130°37.0'E SWEEP 1.0MHz TO 30.0MHz IN 15.0SEC IN MANUAL SCALING

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1											242	230	236	356	246	236								
2										224	242	210	210	246										
3										318			252	236	236	232								
4											264	250	226	236	260									
5											256	248	238	234	334									
6											246	236	236		244	256								
7										244	248	234	234		250	234								
8									254	254	236	228	240	260	300									
9										238	238	238	230	260	260									
10											274	238	220	280	244	226		226		A				
11											234	252	256	236	228	222				A				
12											272	276	254	246	246	236								
13											236	236	236		244									
14											260	288		262										
15										234	234	234	256		258									
16											216	232	232	246	246	232								
17												244	228	254	236	236								
18										244	262	246	262	260	246	228								
19										248	254	C		248	248	248								
20											236	236	242	240	244	242								
21										244	250	250	250	258	234	246								
22										246	228	262	236	236	258									
23											236	236	256	360	242	238								
24											258	242	280	240	240									
25									218		264	232	236	236	250									
26									220	220	238	238	238	248		246								
27										246	246	214	202	E A 268										
28										250	250	218	250	238	262									
29										224	236	244	244	234	246	246								
30												280	226	254	230	230								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT									3	14	27	28	28	26	26	17		1						
MED									220	244	246	238	237	246	246	236		226						
U Q									254	248	258	249	251	260	258	246								
L Q									218	234	236	233	231	236	242	231								

NOV. 2018 h'F2 (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

NOV. 2018 h'F (KM) 135°E MEAN TIME (G.M.T. + 9 H)

LAT.31°12.0'N LON.130°37.0'E SWEEP 1.0MHz TO 30.0MHz IN 15.0SEC IN MANUAL SCALING

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	E B 270	E B 260	E B 262	E B 250	210	204	200	190	190	198	196	E A 236	198	198	A	198	198	198	196	204	E B 268	230	200	E B 236
2	E B 220	E B 240	E B 244	E B 230	204	204	206	192	198	198	192	192	192	180	208	208	206	206	206	204	232	E A 240	E A 250	228
3	252	E B 270	E B 250	246	224	206	204	196	206	194	206	232	204	188	188	A	208	198	196	196	E B 222	232	E B 260	250
4	E B 250	E B 246	E B 244	E A 246	218	178	208	194	194	208	A	A	A	A	A	226	216	198	194	194	216	220	220	E B 240
5	E B 248	E B 248	E B 264	210	210	210	E B 242	192	204	210	198	186	186	190	230	226	214	198	188	E B 246	E B 246	E B 252	E B 258	198
6	E B 270	E B 260	E B 290	E B 268	E B 254	206	240	202	202	214	208	198	182	222	188	190	198	198	208	208	E A 238	E B 238	220	A
7	E A 292	E A 238	E B 238	220	E B 244	214	224	212	202	196	186	A	192	192	208	208	208	208	188	202	E B 248	E B 242	E B 228	228
8	E B 250	E B 266	236	E A 236	184	194	E A 272	206	192	210	204	194	188	188	188	226	208	192	192	E B 262	E A 262	E B 262	E A 256	E B 244
9	E B 256	E B 256	228	E B 234	198	196	E B 288	194	204	198	192	182	186	A	A	208	208	192	188	E A 280	E A 264	E B 234	234	220
10	E B 236	E B 248	E B 262	E B 284	196	A	210	192	188	222	212	212	194	192	A	A	198	A	A	A	A	E A 300	232	E B 232
11	E A 242	222	222	E B 256	E B 240	214	200	200	200	200	A	A	A	206	196	A	196	212	A	A	A	E A 238	E A 296	E A 286
12	E A 286	E B 240	E A 250	E B 254	E B 240	194	192	186	202	202	184	178	196	194	192	A	210	200	200	200	234	200	E B 272	224
13	E B 254	E B 242	E B 244	E B 230	228	E A 234	234	202	202	202	202	188	182	216	202	214	212	200	200	192	E B 232	232	232	222
14	E B 234	E B 246	208	E B 228	E B 248	192	E B 232	196	200	198	198	186	208	176	226	212	198	198	178	178	E B 252	202	202	218
15	E B 254	E B 254	E B 268	250	E B 250	202	E B 240	194	188	180	198	194	220	202	214	208	198	184	182	200	212	220	200	220
16	E B 244	E B 244	E B 244	E B 262	E B 256	E B 212	196	186	194	194	170	188	182	182	194	A	208	200	206	206	E A 252	E B 236	E B 254	210
17	E B 272	E B 242	E B 242	E A 266	228	194	194	188	188	206	206	206	194	192	206	206	218	202	196	190	216	216	210	E B 234
18	E B 242	212	E B 260	E B 260	204	E B 236	206	202	194	202	196	196	172	182	A	182	190	192	192	192	226	222	210	E B 232
19	E B 252	E B 252	E B 260	E B 260	190	186	E B 240	204	204	194	182	C	196	184	184	184	200	200	190	190	226	206	E B 242	218
20	E B 210	E B 252	E B 248	E B 258	E B 258	E B 250	214	180	178	194	202	202	198	182	182	192	194	208	180	196	202	216	E B 240	E B 270
21	E B 258	224	E B 240	E B 250	208	194	198	196	198	198	198	204	194	202	A	198	198	190	190	190	206	214	E B 310	272
22	E B 288	E B 278	244	E B 242	226	202	E B 248	200	198	186	174	174	188	182	202	202	190	182	178	190	E B 200	222	228	E B 234
23	E B 266	E B 244	E B 242	E B 228	208	192	186	194	206	220	A	204	196	188	A	188	196	188	182	180	200	E B 220	198	E B 236
24	E B 254	E B 234	E B 240	E B 234	E B 222	192	182	196	196	214	210	200	216	200	188	216	202	198	186	E A 262	214	208	214	E B 244
25	E B 256	E B 256	E B 228	216	E A 252	198	188	194	174	210	A	A	A	204	188	200	212	190	206	188	A	E A 276	208	E B 256
26	218	E B 246	E A 254	E A 236	E B 238	206	188	188	176	192	192	184	202	184	184	184	228	208	188	A	220	E A 286	E B 238	E B 248
27	E B 248	E B 260	E A 268	E B 238	E B 244	204	196	194	208	186	204	A	A	A	204	228	210	194	194	188	188	E A 266	E B 280	E B 296
28	228	E B 282	E B 248	E B 248	E B 240	206	224	200	200	190	190	184	184	194	178	206	198	188	E A 230	208	E A 246	E B 246	206	206
29	A	E A 300	E B 238	216	E B 250	E B 236	230	218	210	194	194	190	188	178	184	184	194	194	194	190	E B 224	A	E A 286	E B 264
30	E A 262	E A 262	E B 278	E B 242	E B 264	E B 244	E B 236	206	190	184	212	182	188	196	196	196	196	196	196	190	204	212	212	212
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	30	30	30	30	29	30	30	30	30	26	24	26	27	23	25	30	29	28	27	27	29	30	29
MED	E B 252	E B 248	E B 244	E B 244	U 208	199	202	195	198	198	198	192	193	192	194	206	201	198	192	193	U 214	U 217	U 216	E 234
U Q	E B 264	E B 260	E B 260	E B 256	E B 248	E B 213	E B 236	202	202	208	204	203	198	200	206	213	210	200	198	E 206	E B 246	E B 244	E B 256	E B 249
L Q	E B 242	E 242	240	230	208	194	196	192	190	194	192	185	186	182	188	191	198	192	188	190	212	216	210	220

NOV. 2018 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

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NOV. 2018 h'E (KM) 135°E MEAN TIME (G.M.T. + 9 H)

LAT.31°12.0'N LON.130°37.0'E SWEEP 1.0MHz TO 30.0MHz IN 15.0SEC IN MANUAL SCALING

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1							B	118	118	118	118	A	A	A	A	A	118	B	B					
2							B	B	118	118	116	118	114	A	114	114	112	110						
3							B	128	128	116	118	118	118	A	118	118	118	B	B					
4					94		B	B	112	112	112	112	112	108	110	A	A	B	B					
5							B	B	110	110	110	110	A	110	110	110	110	112	B					
6							B	B	122	116	114	A	106	112	A	A	112	132	B					
7							B	B	112	106	108	108	A	108	A	108	108	B	B					
8							B	124	124	A	A	A	A	A	A	A	A	A	B					
9							B	B	112	112	112	112	A	A	A	A	A	A	B					
10							B	122	122	118	120	120	A	A	A	A	A	A	B					
11							B	128	128	A	A	A	A	A	A	A	A	A	B					
12							B	B	112	112	A	A	110	A	A	A	A	A	B					
13							B	B	110	110	A	110	108	108	110	112	A	A	B					
14							B	B	112	112	112	106	106	106	112	114	114	B	B					
15							B	B	A	114	114	114	114	114	114	114	114	B	B					
16							B	B	114	A	A	A	114	114	114	A	114	B	B					
17							B	B	114	114	114	106	106	106	106	A	A	B	B					
18							B	B	116	A	A	A	A	A	A	112	A							
19							B	B	112	112	112	C	A	110	110	110	110	B	B					
20							B		110	110	110	110	A	110	A	A	110	B						
21							B	B	116	118	116	114	114	114	116	116	116	B	B					
22							B	B	114	114	116	112	112	110	110	110	110	B	B					
23							B	B	118	A	118	A	A	A	A	118	A	B	B					
24							B	B	118	A	110	110	110	110	110	A	110	B	B					
25							B	B	110	110	108	108	108	108	108	108	108	B	B					
26							B	B	A	A	A	108	108	108	108	108	A	B	B					
27							B	B	108	108	108	108	108	A	108	108	108	B	B					
28							B	B	A	A	A	A	A	A	A	108	A	B	B					
29							B	B	A	A	A	A	A	A	108	A	A	A	B					
30							B	B	A	A	A	A	A	A	A	108	A	B	B					
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT					1			5	25	20	20	18	16	16	17	17	16	3						
MED					94			124	114	112	113	110	110	110	110	110	111	112						
U Q								128	118	116	116	114	114	111	114	114	114	132						
L Q								120	112	110	110	108	108	108	108	108	110	110						

NOV. 2018 h'E (KM)

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NOV. 2018 h'Es (KM) 135°E MEAN TIME (G.M.T. + 9 H)

LAT.31°12.0'N LON.130°37.0'E SWEEP 1.0MHz TO 30.0MHz IN 15.0SEC IN MANUAL SCALING

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	B	B	B	88	88	B	B	G	G	110	116	102	100	100	98	98	G	98	100	94	94	94	88	88
2	B	B	B	B	B	B	B	134	140	138	122	G	G	94	132	132	G	90	90	90	90	90	90	90
3	90	B	90	88	B	B	B	G	100	G	132	124	G	100	G	142	G	B	G	B	B	B	96	B
4	B	94	94	96	90	90	90	G	142	136	118	118	118	124	120	104	104	104	B	98	98	96	96	96
5	92	B	92	B	92	B	B	136	128	G	G	G	94	G	164	G	G	G	B	B	B	B	B	B
6	88	106	98	B	B	B	B	146	110	130	130	96	G	144	98	98	G	98	92	92	100	92	92	92
7	92	92	92	92	90	B	B	126	154	148	G	148	84	84	84	G	112	112	B	B	B	B	B	112
8	B	90	B	90	90	90	90	90	G	104	104	100	100	100	106	106	106	106	104	104	94	B	94	94
9	92	92	B	92	B	92	B	132	120	120	112	110	96	96	96	94	98	98	98	98	96	96	96	96
10	94	94	90	84	84	84	84	144	122	118	150	120	102	96	96	96	96	92	92	92	92	90	90	90
11	90	90	90	90	B	100	B	G	G	100	100	98	98	98	98	94	94	94	86	86	86	86	86	86
12	86	86	86	102	B	94	B	92	116	118	96	94	138	80	80	80	134	84	84	B	122	96	B	94
13	90	90	B	B	90	90	90	144	G	G	104	G	G	148	136	152	114	100	88	86	90	90	90	90
14	B	94	B	B	B	B	B	B	156	148	148	G	148	G	142	124	G	130	B	B	B	98	B	B
15	B	B	B	B	B	B	104	102	102	G	152	152	152	134	152	144	142	B	B	108	106	106	106	B
16	88	B	B	B	B	B	B	B	G	94	94	90	G	136	146	80	120	120	104	104	92	92	92	92
17	92	92	92	84	86	100	100	B	G	160	146	118	118	118	116	110	102	102	102	102	B	B	102	B
18	B	112	88	88	88	92	102	150	136	102	98	90	90	90	90	G	90	88	88	B	B	B	B	B
19	B	B	B	B	B	B	88	B	G	G	G	C	100	G	G	G	G	136	B	B	94	B	94	B
20	B	B	92	B	B	B	92	92	96	144	132	G	104	G	104	98	G	122	B	96	B	96	84	84
21	82	B	B	B	B	B	B	B	134	146	142	128	126	126	118	G	162	B	94	106	106	98	96	96
22	82	B	B	B	88	94	94	94	G	112	G	112	G	G	100	198	120	B	B	B	B	104	104	B
23	B	B	B	B	B	96	B	152	150	100	114	104	104	104	104	120	106	122	106	100	94	88	B	B
24	B	B	88	B	B	88	88	B	G	98	144	144	144	122	132	104	G	B	B	104	116	106	92	92
25	92	B	B	92	84	84	90	90	G	150	136	130	118	118	G	G	144	92	94	94	94	94	94	94
26	94	104	94	94	94	94	94	90	92	96	96	G	142	134	142	130	110	102	102	102	92	92	92	92
27	92	92	92	92	92	92	B	B	164	154	142	120	164	78	136	124	124	86	86	86	B	102	102	102
28	102	96	96	90	90	90	90	104	104	104	104	104	104	98	98	98	98	B	98	96	96	96	96	96
29	96	92	92	90	B	90	90	90	102	102	102	102	102	94	G	94	94	88	88	88	88	88	92	92
30	92	90	90	B	90	88	B	88	98	98	98	98	98	98	96	G	96	96	96	96	96	96	96	96
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	19	17	17	16	15	18	15	19	20	25	26	23	24	25	26	23	21	23	20	22	21	23	24	21
MED	92	92	92	90	90	91	90	104	121	118	117	110	104	100	105	104	106	98	94	96	94	96	94	92
U Q	92	95	93	92	90	94	94	144	141	145	142	124	132	125	136	130	122	112	101	102	99	98	96	96
L Q	88	90	90	88	88	90	90	90	102	101	102	98	99	95	98	96	97	92	88	92	92	90	91	90

NOV. 2018 h'Es (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Yamagawa

NOV. 2018 TYPES OF Es 135°E MEAN TIME (G.M.T. + 9 H)

LAT.31°12.0'N LON.130°37.0'E SWEEP 1.0MHz TO 30.0MHz IN 15.0SEC IN MANUAL SCALING

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1				F2	F3					C3	C1	L2	L2	L2	L3	L2		L1	L1	F3	F2	F3	F3	F2
2								H1	H2	H1	C2			L2	C1	C1		L2	L4	F3	F2	F1	F2	F2
3	F1		F1	F1					L1		C1	C2		L2		H1							F2	
4		F2	F5	F4	F4	F1	L1		H2	H2	C2	CL22	CL22	C2	C2	L1	L3	L1		F3	F3	F3	F2	F2
5	F3		F2		F1			C2	C3				L2		H1									
6	F2	F1	F2					H2	C2	H1	C1	L3		H1	L2	L2		L2	L6	F3	F1	F4	F4	F5
7	F3	F3	F4	F2	F3			C2	H2	H1		H1	L2	L3	L5		C2	L3						F1
8		F2		F3	F2	F2	L3	L2		L2	L2	L1	L2	L1	L1	L2	L3	L2	L2	F2	F2		F6	F1
9	F1	F1		F1		F1		C2	C2	C2	C2	C1	L2	L4	L4	L4	L5	L3	L1	F4	F3	F2	F3	F4
10	F3	F4	F4	F5	F6	F5	L3	H5	C3	C3	HL13	C2	L3	L2	L2	L3	L4	L7	L9	F7	F9	F9	F4	F2
11	F2	F4	F2	F2		F1				L2	L3	L3	L3	L3	L2	L3	L1	L5	L7	F9	F9	F5	F4	F4
12	F4	F3	F2	F2		F2		L4	CL22	CL22	L2	L3	H1	L3	L2	L5	HL24	L5	L5		F2	F1		F2
13	F2	F2			F4	F4	L2	H2			L2			H1	H1	H1	C2	L3	L3	F2	F2	F2	F2	F2
14		F2							H2	H2	H2		H1		HL11	CL21		C2				F1		
15							L1	L1	L3		H2	H1	H1	H1	H1	H1	H1			F1	F2	F1	F1	
16	F1									L2	L2	L4		H1	H2	L6	CL32	CL32	L7	F4	F4	F1	F2	F2
17	F2	F2	F2	F3	F3	F3	L2			HL22	HL22	C1	C1	C2	C1	L2	L3	L2	L2	F1			F1	
18		F1	F1	F1	F1	F2	L1	HL22	HL22	L2	L2	L3	L2	L2	L2		L3	L4	L3					
19							L2						L1					H2			F1		F3	
20			F2				L1	L1	L3	HL12	HL22		L2		L1	L1		CL11		F1		F1	F2	F2
21	F2								H2	H2	H2	C1	C2	C2	C2		H2		L2	F2	F1	F1	F2	F1
22	F2				F2	F1	L2	L1		C3		C1			L2	H2	C1					F3	F1	
23						F1		HL22	H2	L2	C2	L2	L2	L2	L2	C2	L2	CL22	L2	F1	F2	F2		
24			F1			F3	L3			L3	H2	H2	H1	C2	C2	L2				F4	F2	F2	F2	F2
25	F2			F2	F2	F2	L1	L1		HL22	H2	H1	C1	C1			H2	L2	L1	F1	F4	F3	F2	F2
26	F5	F2	F3	F5	F2	F2	L1	L3	L2	L3	L2		H1	H1	H2	H2	L2	L5	L5	F5	F5	F3	F2	F2
27	F4	F3	F4	F3	F2	F1			H3	H2	H3	C2	H1	L3	H1	C2	C3	L5	L3	F3		F3	F3	F4
28	F4	F4	F2	F2	F2	F3	L1	L2	L7	L3	L2	L2	L3	L3	L2	L2	L2		L4	F3	F2	F2	F5	F3
29	F5	F5	F2	F2		F2	L2	L2	L3	L3	L2	L2	L2	L2		L3	L2	L3	L2	F3	F3	F6	F6	F3
30	F3	F5	F2		F2	F2		L2	L3	L2	L3	L3	L2	L2	L2		L3	L1	L1	F1	F1	F2	F2	F2
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT																								
MED																								
U Q																								
L Q																								

NOV. 2018 TYPES OF Es

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

NOV. 2018 fxI (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

LAT.26°41.0'N LON.128°09.0'E SWEEP 1.0MHz TO 30.0MHz IN 15.0SEC IN MANUAL SCALING

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	X 32	X 32	X 31	33	38	X 33	X 24													X 46	X 40	X 42	X 43	X 36
2	X 36	X 37	X 34	X 34	X 40	X 26	X 28													X 47	X 34	X 36	X 36	X 38
3	38	36	37	38	36	36	X 26													X 48	X 41	X 40	X 40	X 42
4	X 43	X 40	X 38	X 39	X 42	X 30	X 30													X 43	X 38	X 42	39	X 34
5	38	X 36	X 34	X 38	X 37	X 26	X 27													X 39	X 45	X 42	X 41	X 47
6	X 30	X 33	X 32	X 34	X 32	X 33	X 25													X 50	X 47	57	X 54	X 43
7	X 37	X 35	X 34	X 34	X 34	X 24	X 23													X 35	X 31	X 34	X 36	X 38
8	X 36	X 36	X 36	X 40	X 28	A	X 24													X 36	X 40	X 37	X 39	X 38
9	X 36	X 36	X 37	X 37	X 39	X 23	X 23												X 40	X 35	X 33	X 36	X 35	X 38
10	X 38	X 33	X 33	X 32	39	X 24	X 27												X 53	X 40	X 34	X 39	X 38	A
11	X 40	X 44	X 34	X 34	36	X 32	X 26													X 45	X 34	A	A	A
12	X 36	X 35	X 34	X 30	X 32	X 25	X 24												X 65	X 39	X 36	A	X 28	X 34
13	X 33	X 34	X 33	X 33	X 36	X 33	X 26													X 41	X 33	X 36	X 39	X 38
14	X 38	X 38	39	38	39	34	28													X 50	X 35	X 38	X 34	X 33
15	X 34	X 33	X 32	X 31	X 32	X 32	X 29													X 34	X 36	X 39	X 39	X 31
16	X 29	X 31	X 32	X 31	X 29	X 30	X 30													X 48	X 39	X 37	X 38	X 35
17	X 39	X 36	39	X 34	X 36	X 32	X 28													X 41	X 40	X 38	X 37	X 37
18	X 33	X 32	X 32	X 32	X 34	X 31	X 26													X 52	X 46	X 46	X 45	X 36
19	X 36	X 36	X 36	X 36	X 36	X 30	X 25													X 36	X 38	X 33	X 34	X 34
20	X 36	X 33	X 35	X 32	X 32	X 31	X 25													X 53	X 38	X 38	X 36	X 34
21	X 32	X 35	X 36	X 36	X 36	X 32	X 24													X 38	X 38	X 32	X 34	X 35
22	X 33	X 34	X 34	X 35	X 37	X 30	X 30													X 34	X 33	X 36	X 32	X 34
23	X 33	X 36	X 38	X 38	48	X 38	X 24													X 36	X 33	X 31	X 32	X 30
24	35	35	X 33	36	53	39	27													X 34	X 34	X 29	X 31	X 28
25	X 29	34	35	34	X 32	X 32	X 23													X 44	X 33	X 34	X 34	X 28
26	X 31	32	X 31	X 31	X 31	X 25	X 22													X 36	X 30	X 27	X 31	X 32
27	X 33	X 33	X 34	X 32	X 33	X 36	X 24													X 39	X 28	X 27	28	28
28	34	32	32	X 26	X 26	31	A													X 36	X 34	X 36	X 34	X 28
29	X 28	X 32	X 32	X 30	X 32	31	32													X 45	X 34	A	A	X 32
30	X 32	X 34	X 32	X 32	X 33	X 33	X 34												X 40	X 35	X 31	X 32	X 31	X 29
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	29	29												4	30	30	27	28	28
MED	X 34	X 34	X 34	X 34	X 36	X 31	X 26												X 46	X 40	X 34	X 36	X 36	X 34
U Q	X 37	X 36	X 36	X 36	38	X 33	X 28												X 59	X 46	X 39	X 39	X 39	X 38
L Q	X 32	X 33	X 32	X 32	X 32	X 28	X 24												X 40	X 36	X 33	X 33	X 33	X 32

NOV. 2018 fxI (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

NOV. 2018 foF2 (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

LAT.26°41.0'N LON.128°09.0'E SWEEP 1.0MHz TO 30.0MHz IN 15.0SEC IN MANUAL SCALING

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	26	26	25	F 24	F 31	27	18	40	48	54	54	80	69	54	63	79	82	66	64	40	34	36	37	30
2	30	31	28	28	34	20	22	45	54	54	60	89	72	63	52	63	64	55	45	41	28	30	30	32
3	F 30	F 26	F 27	F 27	F 26	F 27	20	43	51	60	54	67	87	J R 83	59	69	62	52	42	42	35	34	34	36
4	36	34	32	33	36	24	24	40	45	48	53	61	68	67	62	70	76	50	43	37	32	36	F 32	28
5	F 26	30	28	32	30	20	21	41	48	56	66	70	95	86	J R 88	105	85	71	42	33	39	36	35	41
6	24	27	26	28	26	27	19	50	55	61	64	79	68	77	H 69	58	64	52	45	44	41	F 48	48	R 37
7	31	29	28	28	28	18	17	42	54	56	73	88	104	H 101	H 84	66	56	54	41	29	25	28	30	32
8	30	30	30	J R 34	22	A	18	42	56	68	73	85	H 62	63	H 66	87	79	58	44	30	34	31	33	32
9	30	30	31	30	33	17	17	41	52	57	62	73	71	68	83	99	70	58	34	29	27	30	29	32
10	32	27	27	26	F 33	19	19	44	51	52	67	89	77	76	98	99	72	52	47	34	28	33	32	A
11	34	38	28	28	F 28	26	20	45	54	54	56	64	78	98	109	84	68	65	63	39	28	A	A	A
12	30	29	28	23	26	19	18	41	53	48	59	67	78	80	77	76	75	69	59	33	30	A	22	28
13	27	28	27	27	30	27	21	44	57	53	58	64	62	H 74	90	78	76	51	46	35	27	30	33	32
14	31	32	F 30	F 27	F 30	F 26	20	40	51	53	58	64	53	64	74	83	62	50	51	44	28	32	28	27
15	28	27	26	25	26	26	23	45	46	54	54	65	55	66	66	66	68	58	38	28	30	33	33	25
16	23	25	26	25	22	24	24	39	50	53	55	61	64	62	61	73	76	60	50	42	33	31	32	29
17	33	30	F 31	28	30	26	21	39	46	52	53	58	61	56	55	65	60	59	51	35	34	32	31	31
18	27	26	26	26	28	25	20	39	50	50	56	71	82	90	91	96	88	59	44	46	40	40	39	30
19	30	30	30	30	30	24	19	39	46	52	66	82	64	72	58	70	64	49	39	30	32	27	28	28
20	30	27	29	26	26	25	19	38	49	55	72	84	66	64	60	76	H 82	52	58	47	32	31	30	28
21	26	29	30	30	30	26	18	34	47	52	64	77	74	61	62	58	58	53	39	32	32	26	28	29
22	27	28	28	29	31	24	24	42	48	60	63	62	76	85	77	61	74	50	43	28	27	30	26	28
23	27	30	32	32	38	32	18	37	44	55	58	65	73	66	66	66	54	48	41	30	27	25	26	24
24	F 24	F 26	27	F 27	F 38	F 31	F 19	37	48	52	64	62	72	72	J R 84	68	62	48	42	28	28	23	25	22
25	23	F 25	F 26	F 26	26	26	17	34	50	52	55	68	82	87	96	J R 85	72	58	37	38	27	28	28	22
26	25	F 24	25	25	25	19	16	33	48	56	60	62	56	62	54	53	61	A	42	30	24	21	25	26
27	27	27	28	26	27	30	18	33	44	54	61	70	75	73	71	J R 71	66	58	41	32	22	21	F 19	20
28	F 22	F 21	F 21	J R 20	20	F 20	A	35	48	60	57	61	59	63	69	72	56	46	41	30	27	30	28	22
29	22	26	26	24	26	F 22	F 20	37	56	70	54	66	62	65	67	68	66	54	48	39	28	A	A	26
30	26	28	26	26	27	27	28	41	46	44	48	54	66	69	71	62	54	46	34	29	25	26	25	23
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	29	29	30	30	30	30	30	30	30	30	30	30	29	30	30	30	27	28	28
MED	27	28	28	27	28	25	19	40	50	54	58	67	70	68	69	70	67	54	43	34	28	30	30	28
U Q	30	30	30	29	31	27	21	42	53	56	64	79	77	80	84	83	76	58	48	40	33	33	33	32
L Q	26	26	26	26	26	20	18	37	47	52	55	62	62	63	62	66	62	50	41	30	27	27	27	26

NOV. 2018 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

NOV. 2018 foF1 (0.01MHz) 135°E MEAN TIME (G.M.T. + 9 H)

LAT.26°41.0'N LON.128°09.0'E SWEEP 1.0MHz TO 30.0MHz IN 15.0SEC IN MANUAL SCALING

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1										L	U L 432	424	A	428	436	408	L	A						
2										L	L 416	424	436	428	U L 388	L								
3										L	U L 424	436	436	A	U L 412	L		L						
4										U L 352	U L 416	420	440	L 432	L	L 392	L							
5											L 424	428	428	L 424	U L 436	L								
6										L	L	428	L 436	432	408	L 404	L							
7										U L 400	L 424	428	432	420	L 416									
8										L	L 436	L 428	A	420	U L 424	408								
9										L	A	A	428	448	412		L							
10										L	L 432	424	440	460	428	L								
11								180			L 404	A	436	440	L 428	L								
12											416	420	440	L 432	A	L 372	L							
13								176	U L 256	L	L 420	420	U L 456	L	L 408	L								
14										L	L 400	416	U L 444	420	412	L 404	L							
15										L	U L 384	412	U L 452	432	L 412	L 388	A	A						
16										L		408	428	428	U L 428	L 400	L							
17										L	L 404	416	U L 420	436	U L 428	L 404	L	L						
18									L		A	460	420	428	416	400	L							
19										U L 400	416	420	U L 424	432	U L 428	384	L							
20										L	L 416	424	424	L 416	U L 416	400								
21											L 408	424	428	L 424	L 424	380	A							
22										L	L	428	424	432	416	L								
23										L	U L 420	L 424	424	420	A	L 388	L							
24									L	L	408	416	424	432	412	384								
25									252	U L 372	U L 416	L	432	424	408	388								
26										L	396	416	U L 428	420	U L 408	A	A	A						
27								176	272	416	L 416	416	420	L 420		U L 400	L							
28										L	404	416	A	A	A	L 396	L							
29									L		U L 400	412	412	424	412	L 388	L							
30											L	U L 416	L 420	416	404	L 384	A							
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								3	3	5	24	27	27	27	25	20								
MED								176	256	U L 400	L 416	420	428	428	L 416	L 394								
U Q								180	272	408	L 422	428	L 436	432	U L 428	L 402								
L Q								176	252	U L 362	L 404	416	424	420	410	386								

NOV. 2018 foF1 (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

NOV. 2018 foE (0.01MHz) 135°E MEAN TIME (G.M.T. + 9 H)

LAT.26°41.0'N LON.128°09.0'E SWEEP 1.0MHz TO 30.0MHz IN 15.0SEC IN MANUAL SCALING

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1								180	228	288	292	304	316	316	U A 292	A	A	188	A					
2								A 212	280		A	A	A	A	A	A	A	A	A					
3								200	240	A	A	A	320	324	288	272	256	200	B					
4								A 228	264	292	312	316	316	308		A	A	A	B					
5								192	228	272	296	U A 312	320	A	A	A	A	A	B					
6								180	228	268	304	A	A	A	A	A	A	A	A					
7								A 240	260	284	304	308	312	304	284	248		A	B					
8								A 248	276	296	304	308	312	U A 296	276	U A 244		A	A					
9								176	252	272	U A 292	U A 312	A	U A 324	A	A	A	184						
10								A 232	272	300		A	A	A	A	A	A	A						
11								B 236	280	288	U A 292	A	A	A	A	A	A	A	B					
12								200	A	272	A	A	316	308	296	A	A	196						
13								B 216	260	292	308	308	316	300	292	U A 256	196	A						
14								180	228	272	292	304	308	308	304	280	244	A	B					
15								B	A	A	A	A	316	308	304	280	248	A	A					
16								B	A	A	A	320	316	312	300	300	264	A	B					
17								A 236	252	292	312	316	324	U A 300	U A 296	A	A	B						
18								B 220	276	A	A	A	A	A	A	252	180	B						
19								172	200	252	A	284	312	292	300	A	248	176	A					
20								B 224	268	300	312	316	308	A	A	240	A	B						
21								184	212	272	284	296	324	312	296	A	A	A	A					
22								B 220	268	292	312	280	292	A	A	A	168	B						
23								180	204	252	268	288	308	308	U A 308	A	U A 228	A	B					
24								B 216	268	292	296	U A 316	320	300	280	248		A	B					
25								B 196	252	276	300	320	308	300	A	U A 244	A	A						
26								A 228	276	A	292	U A 276	312	A	A	A	A	B						
27								B 208	264	288	304	A	304	296	A	A	A	B						
28								A	A	A	A	A	A	A	A	A	A	A	A					
29								B 188	A	A	A	A	A	A	A	A	A	A	B					
30								B	A	A	A	A	A	A	A	A	A	A						
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								10	25	24	19	20	20	21	17	9	13	8						
MED								180	228	270	292	304	316	312	300	280	248	186						
U Q								192	234	274	296	312	316	316	304	294	254	196						
L Q								180	212	262	288	296	308	308	296	278	244	178						

NOV. 2018 foE (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

NOV. 2018 foEs (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

LAT.26°41.0'N LON.128°09.0'E SWEEP 1.0MHz TO 30.0MHz IN 15.0SEC IN MANUAL SCALING

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	J A 18	J A 18	J A 14	18	J A 17	J A 17	J A 17	G	29	34	39	J A 38	J A 46	J A 46	J A 41	J A 38	J A 42	G	J A 32	J A 34	J A 32	19	E B 16	E B 16
2	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	18	21	27	30	J A 38	J A 40	J A 36	J A 38	J A 42	J A 43	J A 32	J A 24	J A 42	J A 34	J A 22	J A 19	J A 18	E B 16
3	E B 16	E B 16	E B 16	J A 18	18	E B 16	E B 16	G	G	33	36	38	41	47	33	34	28	22	E B 16	J A 27	E B 16	E B 16	E B 16	E B 16
4	E B 16	E B 16	20	J A 42	J A 19	J A 26	J A 19	J A 21	29	32	40	39	39	42	40	J A 37	J A 30	J A 26	19	J A 26	J A 21	J A 50	E B 16	J A 40
5	J A 23	J A 18	J A 25	19	20	E B 16	E B 16	G	27	38	35	J A 41	J A 38	J A 38	J A 43	J A 57	J A 46	J A 32	J A 16	J A 20	20	E B 16	18	18
6	18	J A 16	J A 28	E B 16	18	19	17	20	28	33	G	33	33	34	J A 56	J A 32	J A 27	19	J A 24	J A 26	J A 44	J A 27	20	J A 41
7	J A 20	J A 22	J A 22	J A 26	J A 22	J A 32	J A 27	J A 24	27	28	32	35	35	J A 53	37	34	J A 38	J A 40	18	17	19	J A 18	J A 16	E B 16
8	E B 16	E B 16	19	E B 16	E B 16	E B 20	J A 18	18	G	J A 40	35	36	J A 51	38	41	J A 38	J A 44	J A 28	J A 47	E B 16	19	E B 16	22	J A 50
9	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	17	G	G	37	J A 48	J A 50	J A 93	J A 49	J A 38	J A 35	26	21	19	J A 19	J A 26	J A 25	J A 39	J A 42
10	J A 53	J A 22	J A 22	J A 30	J A 43	E B 16	J A 14	18	28	35	G	37	40	J A 42	37	J A 54	J A 39	J A 75	J A 53	J A 55	J A 53	J A 22	J A 64	J A 61
11	J A 22	J A 18	J A 27	19	J A 18	19	E B 16	G	G	35	36	J A 52	J A 88	J A 78	J A 85	J A 43	J A 62	62	E B 16	E B 16	J A 17	J A 32	J A 53	J A 41
12	J A 18	E B 16	J A 19	19	E B 16	E B 16	E B 16	G	27	J A 38	J A 70	J A 48	38	37	40	30	29	G	J A 22	J A 22	J A 22	J A 37	20	19
13	J A 18	J A 21	J A 24	E B 16	E B 16	E B 19	J A 21	G	G	J A 39	34	39	36	40	J A 41	J A 29	27	J A 33	38	J A 17	E B 16	E B 16	E B 16	18
14	J A 21	J A 17	J A 17	E B 16	E B 16	E B 16	E B 16	G	26	33	33	37	35	38	35	34	30	J A 30	J A 16	E B 16	J A 15	E B 16	J A 18	E B 16
15	E B 16	19	E B 16	E B 16	E B 16	E B 16	E B 16	J A 17	25	31	32	36	37	35	32	33	J A 41	J A 30	J A 27	J A 85	J A 82	J A 21	J A 22	J A 15
16	E B 16	E B 16	20	E B 16	E B 16	20	18	J A 20	J A 26	J A 30	36	38	G	J A 50	37	35	30	26	J A 17	22	20	J A 20	18	E B 16
17	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	J A 18	16	26	31	33	35	J A 43	J A 43	J A 38	J A 34	J A 32	J A 21	19	J A 18	J A 18	J A 20	E B 16	18
18	J A 17	E B 16	E B 16	E B 16	J A 20	J A 16	J A 22	J A 18	G	G	J A 72	J A 101	J A 38	J A 47	J A 52	J A 43	G	J A 30	J A 35	J A 17	J A 20	J A 17	E B 16	J A 18
19	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	G	26	31	J A 56	35	34	32	34	J A 52	G	24	J A 20	20	J A 26	J A 21	J A 18	J A 22
20	E B 16	E B 16	E B 16	E B 16	J A 28	E B 16	E B 16	J A 21	28	J A 52	35	36	40	38	J A 36	J A 30	30	24	J A 17	21	J A 18	J A 16	J A 21	J A 26
21	E B 16	E B 16	E B 16	J A 27	E B 16	J A 16	J A 20	G 18	29	33	36	39	38	36	35	J A 39	J A 45	J A 38	J A 28	J A 35	J A 53	J A 21	20	J A 26
22	J A 19	18	E B 16	E B 16	E B 16	J A 20	J A 33	J A 17	24	34	36	35	32	37	J A 55	J A 34	J A 30	20	J A 21	20	J A 30	J A 38	J A 16	E B 16
23	E B 16	J A 17	E B 16	E B 16	E B 16	E B 16	J A 16	J A 20	27	34	35	41	39	37	J A 63	J A 36	J A 28	20	J A 36	J A 18	J A 28	20	J A 19	E B 16
24	E B 16	E B 16	20	20	J A 18	J A 22	J A 17	J A 22	24	G	34	36	J A 61	39	34	32	28	23	J A 23	J A 16	J A 15	J A 22	18	E B 16
25	E B 16	J A 21	J A 34	J A 18	E B 16	J A 38	J A 18	J A 19	23	G	33	40	40	38	J A 40	J A 84	28	24	J A 51	J A 28	J A 26	J A 25	J A 33	J A 20
26	J A 21	J A 25	J A 53	J A 34	J A 42	J A 46	J A 25	J A 22	J A 31	G	J A 34	34	J A 84	J A 60	J A 42	J A 40	J A 53	J A 66	J A 54	J A 52	J A 24	J A 18	J A 19	E B 16
27	19	18	18	J A 38	J A 22	J A 21	J A 18	G	26	J A 34	34	38	J A 38	36	37	J A 39	J A 37	20	E B 16	20	18	18	E B 16	18
28	E B 16	J A 23	J A 32	J A 41	J A 32	17	J A 36	J A 22	J A 32	J A 42	J A 62	J A 40	J A 51	J A 79	J A 85	J A 54	J A 41	J A 44	J A 33	J A 39	J A 53	J A 26	J A 33	J A 18
29	E B 16	E B 16	J A 41	J A 28	J A 26	J A 18	J A 16	J A 20	26	J A 34	J A 39	J A 49	J A 47	J A 48	J A 50	J A 49	J A 49	25	J A 18	J A 22	J A 32	J A 43	J A 28	J A 25
30	J A 78	J A 49	J A 61	J A 36	J A 21	E B 16	J A 13	J A 16	J A 29	J A 34	J A 41	J A 44	J A 57	J A 62	J A 57	J A 51	J A 54	J A 82	J A 25	20	19	18	20	20
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
MED	E B 16	16	19	18	18	16	J A 17	G	26	34	36	38	39	40	J A 40	J A 38	J A 31	J A 26	J A 22	J A 20	J A 22	20	18	18
U Q	J A 19	J A 19	J A 25	J A 27	J A 21	J A 20	J A 19	J A 20	28	J A 35	J A 39	J A 41	J A 47	J A 48	J A 50	J A 43	J A 42	J A 33	J A 35	J A 28	J A 30	J A 25	J A 22	J A 26
L Q	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	G	G 24	31	34	36	36	37	37	34	28	21	18	18	J A 18	E B 18	E B 16	E B 16

NOV. 2018 foEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

NOV. 2018 fbEs (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

LAT.26°41.0'N LON.128°09.0'E SWEEP 1.0MHz TO 30.0MHz IN 15.0SEC IN MANUAL SCALING

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	G	28	34	37	36	43	40	37	33	26	G	22	25	23	E B 16	E B 16	E B 16
2	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	21	26	30	33	35	33	34	33	37	28	22	18	E B 16	E B 16	E B 16	E B 16	E B 16
3	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	G	G 33	36	37	40	45	33	34	27	22	E B 16	26	E B 16	E B 16	E B 16	E B 16	E B 16
4	E B 16	E B 16	E B 16	19	E B 16	E B 16	E B 16	19	29	31	37	39	38	41	38	32	26	21	E B 16	E B 16	E B 16	E B 16	E B 16	20
5	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	G	27	36	33	36	34	34	35	34	28	21	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16
6	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	20	27	32	G	33	32	33	32	29	24	18	22	23	24	22	E B 16	E B 16
7	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	20	26	28	32	34	34	34	35	32	35	34	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16
8	E B 16	E B 16	E B 16	E B 16	E B 16	A A 20	E B 16	18	G 30	32	34	49	36	38	35	30	21	18	E B 16	E B 16	E B 16	E B 16	E B 16	20
9	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	G	G 35	44	44	34	34	32	32	26	20	E B 16	E B 16	E B 16	20	E B 16	E B 16	E B 16
10	E B 16	18	E B 16	E B 16	19	E B 16	E B 16	18	26	34	G	33	36	36	33	30	27	28	33	29	20	E B 16	E B 16	A A 61
11	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	G	G 33	34	47	39	35	33	31	29	26	E B 16	E B 16	E B 16	A A 32	A A 53	A A 41
12	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	G	26	30	32	33	37	36	40	30	28	G	E B 16	20	20	A A 37	E B 16	E B 16
13	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	G	G 27	33	38	34	39	G 23	G 19	G 20	G 18	20	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16
14	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	G	26	32	32	36	34	37	35	31	28	25	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16
15	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	25	31	32	36	37	34	31	31	38	28	24	22	19	E B 16	E B 16	E B 16
16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	24	28	36	37	G	G 25	35	34	29	24	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16
17	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	16	26	30	32	34	38	35	32	30	28	20	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16
18	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	G	G 41	38	32	34	32	30	G	G 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16
19	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	G	25	31	33	34	33	32	32	29	G 24	18	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16
20	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	27	G 18	33	36	35	35	34	29	29	24	E B 16	E B 16	E B 16	E B 16	E B 16	19
21	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	G 12	28	32	36	38	37	35	33	31	32	21	19	18	20	E B 16	E B 16	E B 16
22	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	18	E B 16	23	33	36	35	31	35	35	30	28	20	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16
23	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	27	32	34	40	36	36	40	30	25	20	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16
24	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	24	G 34	35	37	38	32	30	28	22	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16
25	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	22	G 33	39	40	36	33	31	26	20	21	E B 16	E B 16	E B 16	19	E B 16
26	E B 16	E B 16	18	E B 16	E B 16	16	E B 16	19	G 17	G	33	34	34	35	32	35	36	A A 66	E B 16	E B 16	20	E B 16	E B 16	E B 16
27	E B 16	E B 16	E B 16	18	E B 16	E B 16	E B 16	G	25	31	34	38	33	36	36	33	27	20	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16
28	E B 16	E B 16	E B 16	17	17	E B 16	A A 36	18	28	34	33	33	40	46	40	29	26	38	19	23	E B 16	E B 16	22	E B 16
29	E B 16	E B 16	20	E B 16	E B 16	E B 16	E B 16	E B 16	24	33	34	34	34	33	32	29	28	22	E B 16	20	20	A A 43	A A 28	E B 16
30	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	25	32	37	38	33	36	35	28	30	31	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
MED	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	16	25	31	33	36	34	35	33	31	28	22	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16
U Q	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	18	27	33	36	38	38	36	35	33	29	25	19	20	19	16	16	16
L Q	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	G	G 22	G 28	32	34	33	34	32	30	26	20	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16

NOV. 2018 fbEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

NOV. 2018 fmin (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

LAT.26°41.0'N LON.128°09.0'E SWEEP 1.0MHz TO 30.0MHz IN 15.0SEC IN MANUAL SCALING

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	16	16	16	16	16	16	16	15	14	14	14	16	16	14	15	16	14	14	16	16	16	16	16	16
2	16	16	16	16	16	16	16	16	15	16	15	17	18	19	15	15	14	12	16	16	16	16	16	16
3	16	16	16	16	16	16	16	16	14	14	16	21	15	20	19	17	15	16	16	16	16	16	16	16
4	16	16	16	16	16	16	16	16	16	16	14	14	17	14	16	13	12	14	16	16	16	16	16	16
5	16	16	16	16	16	16	16	16	16	14	14	17	16	14	14	14	13	14	16	16	16	16	16	16
6	16	16	16	16	16	16	16	16	16	14	15	19	17	20	15	15	14	14	14	14	16	16	16	16
7	16	16	16	16	16	16	16	16	14	14	14	14	14	15	18	14	16	15	16	16	16	16	16	16
8	16	16	16	16	16	16	16	16	13	14	14	14	14	17	14	18	14	14	16	16	16	16	16	16
9	16	16	16	16	16	16	16	16	15	14	15	15	14	14	16	16	13	14	16	16	16	16	16	16
10	16	16	16	16	16	16	16	14	14	15	14	16	16	15	15	14	14	15	16	16	16	16	16	16
11	16	16	16	16	16	16	16	16	16	15	14	15	15	14	14	14	14	16	16	16	16	16	16	16
12	16	16	16	16	16	16	16	16	16	15	16	14	15	14	14	13	13	16	16	16	16	16	16	16
13	16	16	16	16	16	16	16	16	15	14	14	17	14	14	15	14	14	14	16	16	16	16	16	16
14	16	16	16	16	16	16	16	16	15	15	15	15	16	18	14	14	15	15	16	16	16	16	16	16
15	16	16	16	16	16	16	16	16	16	15	15	14	15	17	15	12	13	14	16	16	16	16	16	16
16	16	16	16	16	16	16	16	16	16	15	14	15	14	16	14	14	13	14	16	16	16	16	16	16
17	16	16	16	16	16	16	16	14	14	14	15	18	15	15	15	15	14	16	16	16	16	16	16	16
18	16	16	16	16	16	16	16	16	16	15	14	14	16	14	14	14	15	15	16	16	16	16	16	16
19	16	16	16	16	16	16	16	16	16	16	14	15	14	14	13	11	16	16	16	16	16	16	16	16
20	16	16	16	16	16	16	16	16	16	14	14	14	16	16	16	15	14	16	16	16	16	16	16	16
21	16	16	16	16	16	16	16	16	14	16	14	15	16	16	16	14	14	14	14	16	16	16	16	16
22	16	16	16	16	16	16	16	16	14	14	14	16	16	16	16	15	15	15	16	16	16	16	16	16
23	16	16	16	16	16	16	16	16	16	14	15	15	17	18	15	15	15	16	16	16	16	16	16	16
24	16	16	16	16	16	16	16	16	16	16	16	16	16	16	14	14	14	16	16	16	16	16	16	16
25	16	16	16	16	16	16	16	16	16	14	14	16	16	16	14	15	15	16	16	16	16	16	16	16
26	16	16	16	16	16	16	16	16	16	15	13	18	14	14	14	14	15	14	16	16	16	16	16	16
27	16	16	16	16	16	16	16	16	16	16	14	14	15	15	14	14	16	16	16	16	16	16	16	16
28	16	16	16	16	16	16	16	16	16	13	14	15	15	15	15	15	14	16	16	16	16	16	16	16
29	16	16	16	16	16	16	16	16	16	16	15	15	14	14	14	13	14	15	16	16	16	16	16	16
30	16	16	16	16	16	16	16	16	16	16	14	14	14	14	14	14	15	16	16	16	16	16	16	16
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
MED	16	16	16	16	16	16	16	16	16	15	14	15	15	15	15	14	14	15	16	16	16	16	16	16
U Q	16	16	16	16	16	16	16	16	16	16	15	16	16	16	15	15	15	16	16	16	16	16	16	16
L Q	16	16	16	16	16	16	16	16	14	14	14	14	14	14	14	14	14	14	16	16	16	16	16	16

NOV. 2018 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

NOV. 2018 M(3000)F2 (0.01) 135°E MEAN TIME (G.M.T. + 9 H)

LAT.26°41.0'N LON.128°09.0'E SWEEP 1.0MHz TO 30.0MHz IN 15.0SEC IN MANUAL SCALING

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	317	305	282	F 317	F 358	387	359	400	399	400	330	376	394	382	316	366	370	385	368	352	304	309	362	343
2	321	337	346	333	422	321	343	381	397	364	374	378	395	387	359	355	388	383	364	410	320	334	321	340
3	F 288	F 297	F 307	F 305	F 353	F 357	385	391	371	392	353	345	381	J R 338	355	344	401	371	360	376	323	323	325	337
4	346	341	315	369	388	374	380	407	398	370	354	346	352	338	321	355	384	397	372	336	323	359	F 341	328
5	F 308	318	331	382	372	334	325	376	381	356	361	332	368	349	J R 253	354	325	347	381	294	305	327	310	377
6	306	322	302	320	329	364	309	368	395	360	342	364	348	356	H 346	363	381	375	347	344	315	F 289	371	R 319
7	289	315	352	343	397	384	308	386	386	337	352	341	359	H 317	H 320	373	362	389	385	347	297	316	334	352
8	328	319	334	J R 381	426	A	324	378	366	360	347	390	H 358	349	H 285	351	381	400	391	326	312	326	327	338
9	334	335	357	368	394	405	310	380	379	372	363	357	352	317	334	379	384	401	369	351	312	327	340	359
10	351	335	316	309	F 356	407	393	354	409	372	345	364	356	326	346	371	395	370	383	383	297	342	331	A
11	334	363	315	319	F 339	367	304	370	399	380	384	337	334	347	377	343	358	365	367	400	318	A	A	A
12	309	310	390	332	336	336	397	390	397	366	361	342	346	332	340	354	371	365	347	379	324	A	311	326
13	318	342	318	336	340	377	336	390	401	393	370	373	334	H 290	356	336	381	392	367	388	317	322	347	334
14	347	327	F 313	F 319	F 368	F 375	F 337	379	375	399	375	387	326	339	363	348	366	377	377	366	315	349	354	349
15	327	334	322	312	355	352	358	383	393	401	351	379	332	357	345	357	395	379	363	308	338	356	384	363
16	321	336	341	355	306	315	370	393	397	368	370	360	343	358	341	349	353	348	354	427	295	331	354	340
17	347	323	F 350	310	343	383	348	401	394	382	375	390	367	349	356	364	374	383	386	356	345	344	327	368
18	334	339	341	336	365	386	346	388	391	361	357	342	341	314	322	341	361	384	330	357	335	338	333	339
19	317	315	345	340	379	402	331	377	370	343	350	362	343	349	343	362	384	375	370	310	389	328	349	329
20	372	319	347	327	320	322	375	371	379	360	373	382	365	338	331	347	H 339	362	367	345	314	364	346	323
21	311	327	339	343	358	348	451	374	373	353	353	366	383	373	349	400	388	367	365	374	348	321	333	346
22	303	314	306	321	369	365	356	370	367	365	375	322	338	355	357	359	383	389	391	405	313	347	318	318
23	310	295	306	325	346	409	445	374	379	352	348	356	359	318	352	387	382	393	384	332	375	331	361	352
24	F 314	F 318	304	F 327	F 378	F 420	F 326	382	390	358	374	350	340	349	J R 298	325	382	381	396	415	362	354	377	315
25	316	F 312	F 318	F 324	349	355	372	389	382	375	343	353	342	324	317	J R 330	377	405	379	353	347	320	383	333
26	309	F 377	324	352	365	417	R	369	367	374	356	343	351	368	363	365	378	A	383	401	331	327	334	321
27	310	316	341	335	336	395	407	376	370	364	347	357	352	311	325	J R 278	378	390	371	400	360	341	F 352	334
28	F 292	F 364	F 310	J R 340	318	F 362	A	389	373	381	374	363	363	348	346	370	388	388	364	381	343	336	358	320
29	345	313	338	303	320	F 325	F 336	372	377	388	373	396	366	361	335	346	365	367	361	399	345	A	A	341
30	349	329	312	304	309	328	368	399	413	383	361	322	349	362	362	366	404	381	374	371	337	340	356	348
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	29	28	30	30	30	30	30	30	30	30	30	30	29	30	30	30	27	28	28
MED	318	322	323	330	356	367	352	380	384	369	359	358	352	348	344	355	381	381	370	368	323	331	344	338
U Q	334	336	341	343	372	391	378	390	397	382	373	376	365	357	356	366	384	390	383	399	345	344	357	348
L Q	309	315	312	319	336	342	328	374	373	360	350	343	342	326	322	346	366	368	364	345	313	323	329	327

NOV. 2018 M(3000)F2 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

NOV. 2018 M(3000)F1 (0.01) 135°E MEAN TIME (G.M.T. + 9 H)

LAT.26°41.0'N LON.128°09.0'E SWEEP 1.0MHz TO 30.0MHz IN 15.0SEC IN MANUAL SCALING

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1										L	U L 393	393	A	413	376	L 368	L	A						
2										L	L 393	412	407	403	U L 435	L								
3										L	U L 400	399	A	A	U L 417	L		L						
4										U L 451	U L 402	A 404	420	A	L	L 386	L							
5											L 380	404	398	L 411	U L 369	L								
6										L	L	388	L 405	388	397	L 384	L							
7										U L 393	L 377	388	375	394	L 391									
8										L	L 386	L 386	A	420	U L 390	378								
9										L	A	A	407	400	404		L							
10										L	L 365	397	382	372	371	L								
11								444			L 402	A	381	381	L 381	L								
12											383	436	371	L 390	A	L 435	L							
13								441	U L 444	L	L 398	397	U L 383	L	L 368	L								
14										L	L 416	412	U L 406	388	387	L 388	L							
15										L	U L 452	400	U L 383	385	L 395	L 405	A	A						
16										L		455	419	387	U L 391	L 378	L							
17										L	L 421	398	U L 409	389	U L 378	L 378	L	L						
18									L		A	373	414	382	381	390	L							
19										U L 389	393	395	U L 399	383	U L 383	388	L							
20										L	L 376	387	403	L 406	U L 407	386								
21											L 381	380	379	L 393	L 397	414	A							
22										L	L	421	417	384	382	L								
23										L	U L 380	A 378	385	402	A	L 399	L							
24									L	L	395	410	397	379	383	401								
25									441	U L 399	U L 406	L	A 375	374	379	403								
26										L	412	415	U L 419	374	U L 405	A	A	A						
27								463	468	377	L 385	407	400	L 392		U L 383	L							
28										L	395	399	A	A	A	L 379	L							
29									L		U L 413	410	424	394	394	L 386	L							
30											L	U L 400	L 410	385	387	L 395	A							
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								3	3	5	24	27	26	26	25	20								
MED								444	444	U L 393	L 394	399	402	388	L 387	L 387								
U Q								463	468	U L 425	U L 404	410	410	400	U L 397	400								
L Q								441	441	383	L 382	388	383	383	380	L 381								

NOV. 2018 M(3000)F1 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

NOV. 2018 h'F2 (KM) 135°E MEAN TIME (G.M.T. + 9 H)

LAT.26°41.0'N LON.128°09.0'E SWEEP 1.0MHz TO 30.0MHz IN 15.0SEC IN MANUAL SCALING

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1										216	308	238	214	238	318	236	234	200						
2										238	234	228	210	226	226	260								
3										224	262	260	224	240	256	238		212						
4										230	254	272	266	258	270	250	218							
5											248	266	230	242	292	238								
6										250	252	244	258	254	220	244	228							
7										262 L	256	264	234	226	242									
8										250	250	214	238	268	294	248								
9										244	258	248	252	304	262		212							
10										242	270	232	240	274	254	222								
11								216			224	274	260	250	214	222								
12											256	268	256	244	244	236	218							
13								204	200	218	242	240	278	U 276 L	244	222								
14										220	232	228	L 308	270	236	230	220							
15										218	228	238	L 294	266	248	244	212	206						
16										222		266	262	252	278	254	226							
17										234	248	226	252	278	264	248	226	210						
18									210		260	270	252	234	238	232	208							
19										272	258	232	264	244	276	232	216							
20										248	238	230	236	244	266	254								
21											266	232	226	236	268	214	216							
22										248	234	278	264	234	242	240								
23										262	268	258	252	266	262	218	216							
24									206	248	232	264	256	266	240	246								
25									212	236	266	260	248	258	238	228								
26										232	266	266	266	248	258	238	218	A						
27								194	222	264	248	250	244	252		272	224							
28										234	244	238	244	254	254	222	222							
29									220		236	218	244	252	244	246	224							
30											258	260	262	246	242	232	208							
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								3	6	23	29	30	30	30	29	28	18	4						
MED								204	211	238	252	249	252	252	254	238	218	208						
U Q								216	220	250	261	266	262	266	267	247	224	211						
L Q								194	206	224	237	232	238	242	241	229	216	203						

NOV. 2018 h'F2 (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

NOV. 2018 h'F (KM) 135°E MEAN TIME (G.M.T. + 9 H)

LAT.26°41.0'N LON.128°09.0'E SWEEP 1.0MHz TO 30.0MHz IN 15.0SEC IN MANUAL SCALING

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	260	272	298	Q 282	210	192	272	184	206	208	210	212	A	E A 220	218	216	206	A	206	208	280	264	208	210
2	254	244	238	234	178	E B 270	242	206	210	194	194	198	192	180	174	E A 242	216	214	216	176	234	232	246	220
3	Q 268	Q 276	Q 266	Q 270	Q 230	Q 204	206	194	210	214	204	208	A	A	172	228	200	196	180	196	220	234	242	234
4	224	218	256	226	206	206	208	188	196	182	E A 216	E A 224	184	A	A 240	206	210	194	192	182	238	214	218	288
5	Q 258	260	270	202	204	260	276	198	212	232	208	198	198	170	226	A	224	208	178	268	240	224	276	196
6	248	268	306	274	234	210	302	222	206	218	206	202	198	198	200	188	218	204	206	212	258	258	212	212
7	250	250	232	234	192	244	376	214	208	184	204	198	210	204	220	230	220	202	190	190	284	268	242	224
8	240	276	240	204	178	A	316	208	212	208	214	206	A	188	210	A 232	212	196	180	186	258	228	244	248
9	234	244	234	222	192	222	366	206	208	226	A	A	186	186	166	216	206	198	172	218	250	246	242	222
10	234	A 256	276	268	260	198	220	206	194	212	194	204	200	222	188	208	204	194	216	A 224	E A 316	248	248	A
11	230	208	272	272	Q 240	202	304	182	204	218	212	A	E A 236	190	186	198	210	214	186	180	250	A	A	A
12	250	248	198	244	232	252	226	194	210	196	208	176	240	210	A	192	214	216	178	194	262	A	270	258
13	268	236	264	238	230	196	226	E B 192	182	178	206	E A 230	H 188	240	E A 242	202	222	192	196	178	230	246	220	228
14	224	244	Q 260	Q 256	Q 214	Q 204	274	206	214	212	192	198	178	A 226	214	218	206	202	200	180	226	222	196	228
15	252	250	264	270	222	232	224	198	188	202	178	220	214	H 196	H 182	194	A	A	194	E A 324	A 246	212	200	220
16	276	246	254	224	304	266	202	186	194	186	210	172	182	200	214	238	214	186	186	172	206	234	220	238
17	216	238	Q 224	Q 244	Q 224	188	220	194	198	208	186	200	E A 214	196	182	212	210	200	186	192	226	212	202	204
18	240	242	240	248	224	192	260	200	182	188	A	A 218	172	194	210	200	192	190	186	186	206	214	218	208
19	262	252	228	238	196	186	290	204	206	208	202	200	184	200	208	198	194	202	194	204	206	238	222	258
20	210	252	218	262	258	252	218	210	212	206	216	216	204	198	186	172	214	200	196	178	196	212	234	244
21	274	248	242	230	220	210	180	182	208	220	226	A	224	214	194	204	A	202	200	198	230	256	240	232
22	284	278	278	252	194	220	250	214	184	236	232	198	160	210	210	198	208	196	184	176	260	214	246	Q 270
23	Q 284	Q 278	Q 256	240	Q 208	182	184	212	210	222	222	A	220	208	A	214	192	200	194	192	206	248	228	242
24	Q 280	Q 252	280	Q 270	Q 208	178	Q 288	204	182	178	206	194	216	238	210	202	226	200	186	172	212	206	208	268
25	276	Q 250	Q 268	Q 266	Q 234	232	260	208	188	184	198	A 258	A	238	224	212	212	196	180	186	200	244	204	258
26	Q 280	206	268	240	218	210	304	198	210	210	188	180	172	A 242	200	A	A	A	184	184	E A 264	248	250	246
27	242	268	240	260	250	200	216	172	174	218	220	214	174	220	250	232	220	202	172	174	214	246	274	Q 258
28	Q 322	Q 214	Q 286	286	330	218	A	212	216	222	214	192	A	A	A	198	214	206	200	202	218	236	234	240
29	258	258	E A 266	302	266	272	272	216	198	208	198	188	176	186	198	202	214	208	186	184	234	A	A	228
30	218	244	292	284	260	252	210	192	194	188	A 244	A 220	178	226	A 216	198	A	208	184	200	230	238	208	236
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	29	29	30	30	30	28	26	25	27	27	28	26	27	30	30	30	27	28	28
MED	253	250	260	250	223	210	250	202	206	208	206	200	189	202	209	204	212	200	186	187	231	236	231	235
U Q	274	260	272	270	240	248	289	208	210	218	215	A 216	214	222	218	217	216	206	196	202	258	248	245	253
L Q	234	244	240	234	206	197	217	192	194	188	198	198	178	194	186	198	206	196	184	180	214	214	210	221

NOV. 2018 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

NOV. 2018 h'E (KM) 135°E MEAN TIME (G.M.T. + 9 H)

LAT.26°41.0'N LON.128°09.0'E SWEEP 1.0MHz TO 30.0MHz IN 15.0SEC IN MANUAL SCALING

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1								126	112	102	102	102	102	102	104	A	A	108	A					
2								A	104	116	A	A	A	A	A	A	A	A	A					
3								148	102	A	A	A	108	108	104	104	108	112	B					
4								A	112	102	102	102	102	102	108	A	A	A	B					
5								128	106	112	106	106	106	A	A	A	A	A	B					
6								140	104	104	104	A	A	A	A	A	A	A	A					
7								A	122	114	110	102	102	102	102	100	104	A	B					
8								A	104	104	104	104	100	100	100	102	102	A	A					
9								128	114	102	102	102	A	102	A	A	A	108						
10								A	106	104	100	A	A	A	A	A	A	A						
11								B	106	106	104	100	A	A	A	A	A	A	B					
12								132	A	106	A	A	102	102	102	A	A	116						
13								B	100	100	100	100	104	102	104	108	104	102	A					
14								132	104	104	102	102	102	102	102	102	108	A	B					
15								B	A	A	A	A	102	102	102	102	104	A	A					
16								B	A	A	A	104	104	102	102	108	108	A	B					
17								A	106	106	106	114	110	104	108	106	A	A	B					
18								B	Q 104	104	A	A	A	A	A	A	104	104	B					
19								154	100	100	A	100	102	104	102	A	104	104	A					
20								B	104	104	104	104	106	104	A	A	104	A	B					
21								154	100	102	100	100	102	102	104	A	A	A	A					
22								B	104	104	104	102	102	102	A	A	A	108	B					
23								148	102	104	102	104	104	104	104	A	104	A	B					
24								B	104	100	104	104	104	110	108	108	110	A	B					
25								B	102	102	102	102	102	102	102	A	110	A	A					
26								A	110	104	A	100	100	104	A	A	A	A	B					
27								B	102	106	106	106	A	106	106	A	A	A	B					
28								A	A	A	A	A	A	A	A	A	A	A	A					
29								B	102	A	A	A	A	A	A	A	A	A	B					
30								B	A	A	A	A	A	A	A	A	A	A						
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								10	25	24	19	20	20	21	17	9	13	8						
MED								136	104	104	104	102	102	102	104	104	104	108						
U Q								148	106	106	104	104	104	104	105	108	108	110						
L Q								128	102	102	102	101	102	102	102	102	104	104						

NOV. 2018 h'E (KM)

IONOSPHERIC DATA STATION Okinawa

NOV. 2018 h'Es (KM) 135°E MEAN TIME (G.M.T. + 9 H)

LAT.26°41.0'N LON.128°09.0'E SWEEP 1.0MHz TO 30.0MHz IN 15.0SEC IN MANUAL SCALING

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	94	94	92	92	88	88	88	G	130	120	112	114	106	106	100	102	98	G	90	86	86	86	B	B
2	B	B	B	B	B	B	148	136	166	148	106	100	98	98	98	96	96	96	90	90	90	84	84	B
3	B	B	B	90	90	B	B	G	G	166	160	144	138	118	118	174	168	146	B	104	B	B	B	B
4	B	B	92	90	90	90	90	90	138	146	118	114	130	136	124	122	108	106	118	84	96	94	B	90
5	90	96	92	82	92	B	B	G	126	108	112	106	106	106	90	88	98	88	120	88	86	B	122	98
6	188	100	96	B	94	104	90	162	148	132	G	100	100	100	96	102	96	96	94	90	90	90	90	88
7	88	90	90	90	84	84	84	84	154	138	166	158	146	92	118	112	114	102	102	100	96	96	92	B
8	B	B	92	B	B	92	90	170	G	116	120	110	100	104	102	104	96	100	94	B	94	B	92	92
9	B	B	B	B	B	B	154	G	G	104	102	102	104	104	108	102	160	136	88	142	96	94	90	96
10	96	90	92	92	92	B	94	148	130	110	G	112	110	108	100	104	96	94	90	90	90	90	104	98
11	98	94	94	94	92	92	B	G	G	156	106	98	100	100	98	100	98	92	B	B	90	90	90	84
12	82	B	98	90	B	B	B	G	146	88	88	86	156	142	170	112	162	G	88	148	126	92	92	92
13	90	96	92	B	B	104	88	G	G	104	174	114	116	166	92	90	108	84	84	82	B	B	B	94
14	94	94	94	B	B	B	B	G	166	134	134	102	116	162	140	130	116	104	104	B	98	B	94	B
15	B	88	B	B	B	B	B	116	108	172	104	164	162	110	122	106	126	118	106	104	98	96	96	94
16	B	B	90	B	B	90	90	106	102	102	156	160	G	90	146	152	136	122	110	104	88	90	90	B
17	B	B	B	B	B	B	100	146	178	152	116	122	110	106	116	114	104	98	84	86	82	88	B	84
18	84	B	B	B	94	90	96	96	G	G	98	98	106	98	100	90	G	96	96	84	88	86	B	84
19	B	B	B	B	B	B	B	G	158	122	96	162	116	124	112	84	G	134	116	114	92	92	92	82
20	B	B	B	B	98	B	B	96	156	96	136	152	118	110	100	100	148	122	116	86	86	86	92	92
21	B	B	B	92	B	92	92	90	156	150	134	126	134	142	134	98	96	96	96	90	90	92	92	110
22	84	88	B	B	B	88	88	86	148	152	182	170	108	102	102	102	100	134	92	92	116	104	102	B
23	B	86	B	B	B	B	92	92	160	142	134	108	108	108	106	106	100	136	92	100	100	100	86	B
24	B	B	86	96	100	94	92	92	132	G	170	110	92	136	148	148	184	130	86	102	90	86	88	B
25	B	98	98	98	B	90	88	90	136	G	188	156	142	138	116	102	146	118	92	92	88	132	116	112
26	120	100	100	104	94	94	94	88	90	G	104	104	108	108	106	106	108	96	108	110	88	104	84	B
27	104	86	90	92	104	92	98	G	164	100	170	180	102	176	146	96	96	120	B	86	86	124	B	114
28	B	92	92	92	92	90	90	86	124	118	104	104	104	98	96	108	110	96	96	94	94	96	92	86
29	B	B	90	88	88	92	90	92	106	104	102	104	98	98	96	92	92	154	126	94	92	88	88	88
30	94	92	90	94	90	B	90	114	112	106	100	102	102	100	112	96	92	94	94	100	108	104	90	88
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	14	16	19	16	16	17	22	20	24	26	28	30	29	30	30	30	28	28	27	27	28	25	23	20
MED	94	93	92	92	92	92	90	94	142	121	117	111	108	107	107	102	106	103	94	92	90	92	92	92
U Q	98	96	94	94	94	93	94	126	157	148	158	152	124	136	122	112	131	126	108	104	96	98	94	97
L Q	88	89	90	90	90	90	90	90	125	104	104	102	102	100	100	96	96	96	90	86	88	88	90	87

NOV. 2018 h'Es (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Okinawa

NOV. 2018 TYPES OF Es 135°E MEAN TIME (G.M.T. + 9 H)

LAT.26°41.0'N LON.128°09.0'E SWEEP 1.0MHz TO 30.0MHz IN 15.0SEC IN MANUAL SCALING

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	F2	F2	F1	F1	F2	F1	F2		H1	C2	C2	C1	C2	C1	C3	CQ21	LQ21		L4	F3	F4	F1		
2							F1	H2	H1	HC11	CH11	CH11	L1	L1	L2	L3	L2	L3	LQ31	F3	F2	F2	F1	
3				F1	F1					HL11	HL11	HL11	HL11	CL41	C1	H1	H1	HL11		F3				
4			F1	F4	F2	F3	F1	L1	H2	H1	CL11	CL11	H1	H1	C1	CQ11	C1	CQ11	C1	FF11	F2	F4		F3
5	F2	F1	F1	F1	F1				C1	C2	C1	C1	C1	C1	L2	L3	L2	L2	C1	F1	F1		F1	F1
6	F1	F1	F1		F1	F1	F1	H3	H1	H1		C1	C1	L1	L1	C1	L1	L1	L3	F8	F4	F5	F3	F4
7	F2	F2	F1	F2	F2	F2	FQ11	LH12	HL21	HL11	HL11	H1	H1	LH11	C1	C1	C2	C8	C1	F1	F1	F2	F2	
8			F1			F2	FF31	HC11		C1	C1	C1	C4	C1	C2	C2	LC11	C3	L2		F1		F1	F4
9							F1			C2	C3	C3	C2	C2	C1	C2	HC11	H1	L1	F2	F1	F4	F3	F4
10	F3	F3	F2	F3	FQ31		F1	H1	H2	C2		C1	C1	C1	C2	C1	LQ21	L4	L4	F5	F4	F5	FF13	FQ51
11	F2	F1	F2	F1	F2	F1				H2	C1	C2	CQ31	CQ21	LQ31	LQ11	LQ31	LQ41			F1	F9	F7	F5
12	F2		F1	F1					HL22	LC31	LQ41	LCQ11	H1	H1	H1	CL12	HC22		L1	F3	F1	F7	F2	F2
13	F1	F1	F2			F1	F2			C1	H1	C1	C1	HL11	LH21	L1	CL12	L4	L3	F1				F1
14	F2	F2	F1						H1	H2	H1	C2	C1	H1	H1	H1	C1	C4	C1		F1		F1	
15		F1						C1	C2	HC11	C1	HC11	HC11	C1	C1	C1	C3	C4	CL81	FF71	FQ31	FF11	F1	F2
16			F1			F2	F1	C1	C2	C1	HL11	HL11		LH21	H2	H1	HL11	C2	C1	F1	F1	F1	F1	
17							F1	H1	H1	HC11	C1	CL11	CL11	C2	CQ11	C1	C1	L2	L1	F1	F1	F1		F1
18	F1				F1	F1	F2	L1			CQ31	CQ31	C1	L2	L2	L2		LH11	L1	F1	F1	F1		F1
19									H1	C1	LC11	HC11	C1	C1	C1	LC11		H2	C2	F1	F4	F1	F1	F1
20					F1			LH11	H1	LH12	H1	H1	C1	C1	C2	C1	H1	C3	C1	F1	F2	F2	F2	F3
21				F2		F1	F1	L1	H1	H1	H1	C2	H1	H1	HC11	L1	LQ31	LQ21	LQ31	FQ41	FQ31	F1	F1	F1
22	F1	F1				F2	F5	L1	H1	H2	H1	H1	C1	C1	C1	CQ11	CH21	H2	L1	F1	FF31	F1	F1	
23		F1					F1	L1	H2	HC21	H2	C1	C1	C2	C2	CQ11	CQ11	HL21	LQ11	F1	F2	F1	F1	
24			F1	F1	F1	FQ11	F2	L1	H1		HC12	C2	LHC12	HL11	H2	H1	HL11	HL21	L3	F1	F1	F2	F1	
25		F1	F2	F2		F3	F1	L1	H1		H1	H1	H1	H2	CH11	CH11	HC11	C2	LCQ21	F1	F4	FF12	FF52	F2
26	F1	F1	FQ41	FQ21	FQ21	FQ31	FQ21	L3	LH22		C2	C2	C1	CH11	CQ11	CQ21	CQ31	L6	CL11	FFQ11	F5	FF12	F1	
27	F1	F1	F1	F3	F2	F3	F1		H1	LH11	H1	HL11	C1	HL11	HL11	L2	L2	C2		F1	F1	F1		F1
28		F1	F3	F5	F5	F1	F5	L2	CQ21	CQ31	CQ21	CQ21	CQ41	LQ31	LQ31	LQ21	CQ11	LQ41	LQ31	FQ51	F2	F2	F3	F1
29			F4	F7	F2	F1	F2	L2	C4	C2	CQ21	CQ21	LQ21	LQ21	LQ21	LQ21	LH11	HL11	CL11	F3	F5	F4	F6	F3
30	F2	F2	F4	F2	F2		F1	C1	CQ21	C3	C3	CQ31	CQ21	CQ31	CL13	LQ31	LQ41	LQ21	L1	F1	F1	F1	F2	F2
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT																								
MED																								
U Q																								
L Q																								

NOV. 2018 TYPES OF Es

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

f-PLOTS OF IONOSPHERIC DATA

KEY OF f-PLOT	
	SPREAD
	foF2,foF1,foE
	fxF2
	DOUBTFUL foF2,foF1,foE
	fbEs
	ESTIMATED foF1
	fmin
	GREATER THAN
	LESS THAN

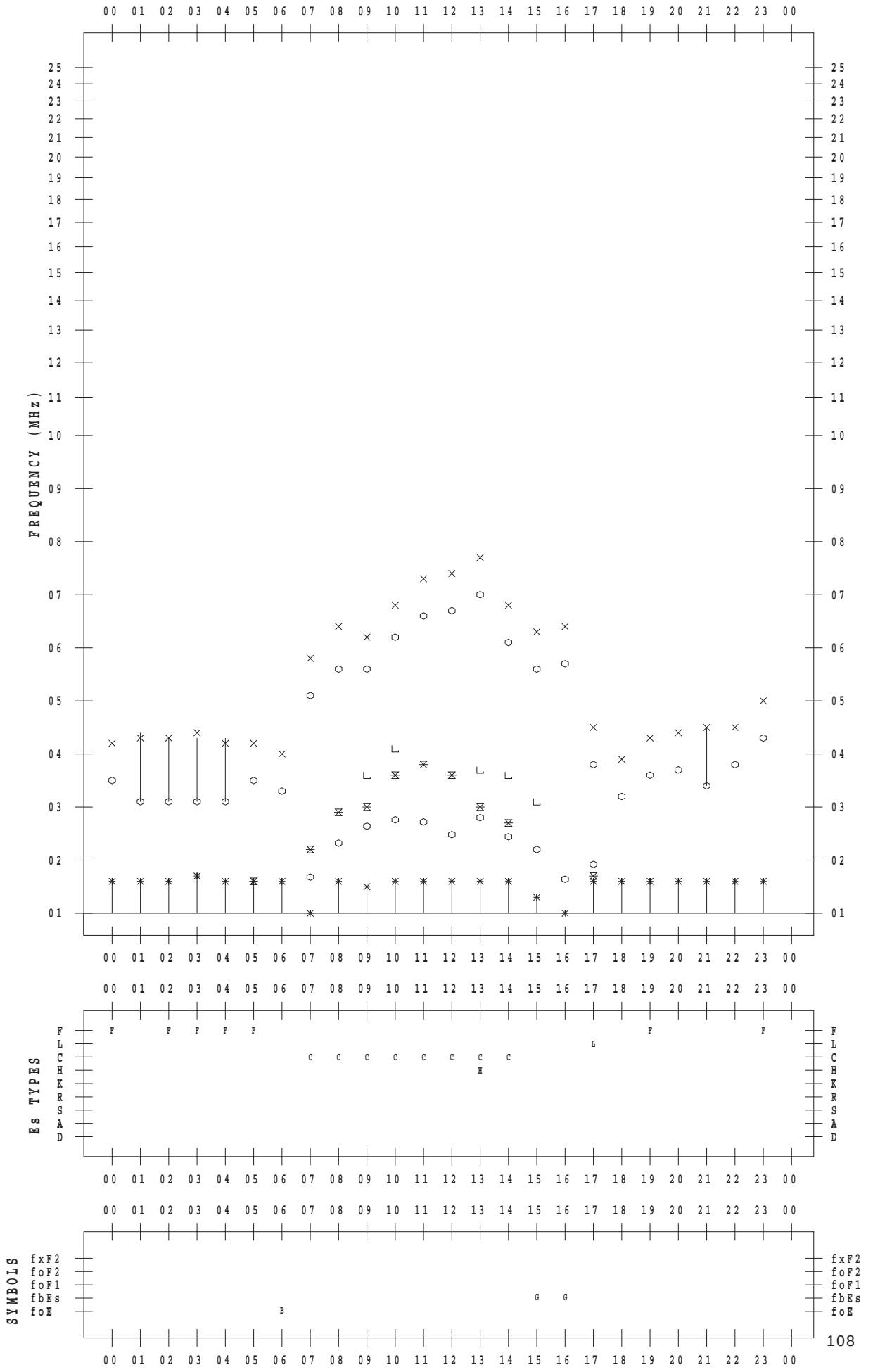
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018/11/ 1

135 °E MEAN TIME



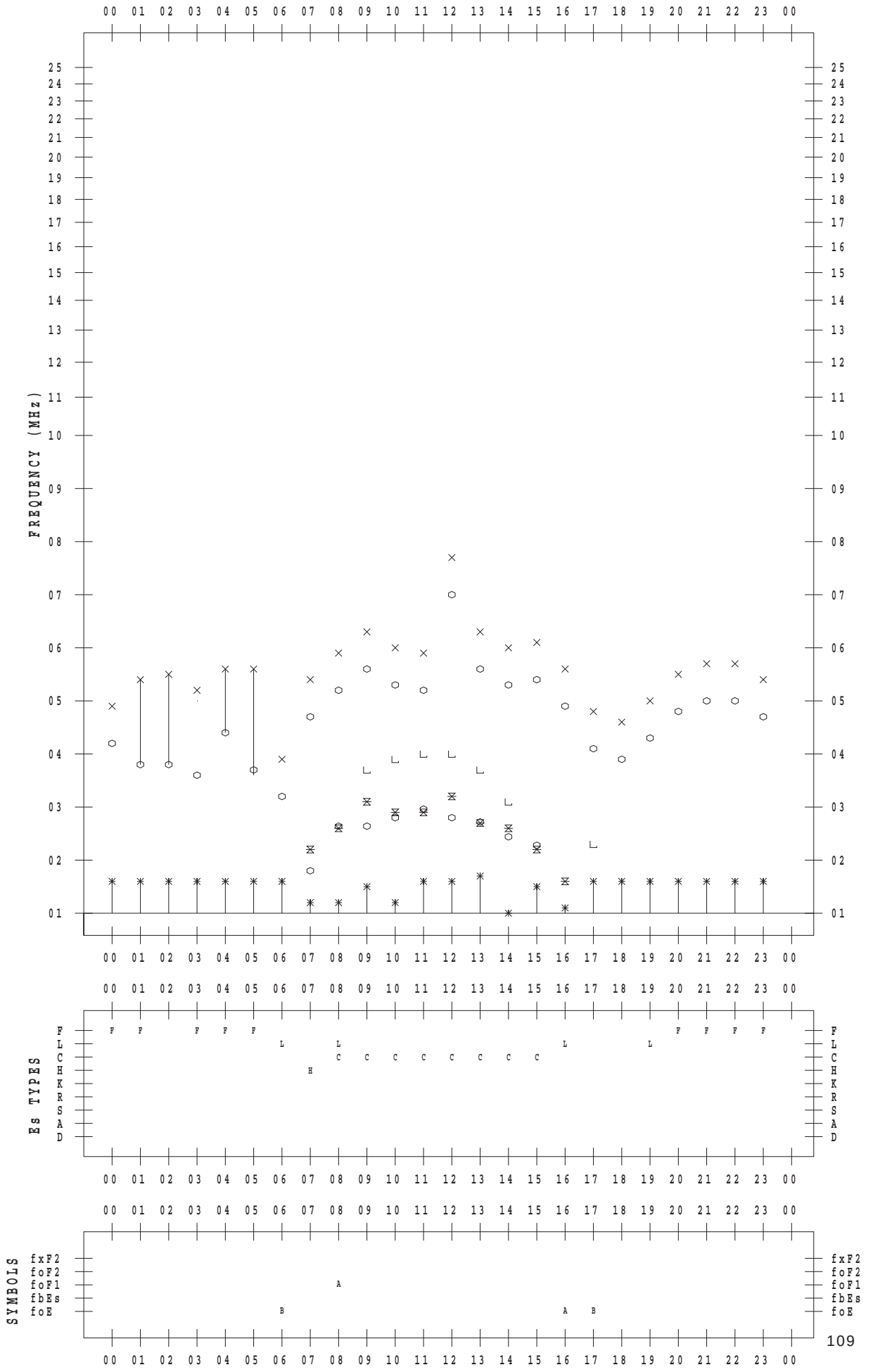
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018/11/ 2

135 °E MEAN TIME



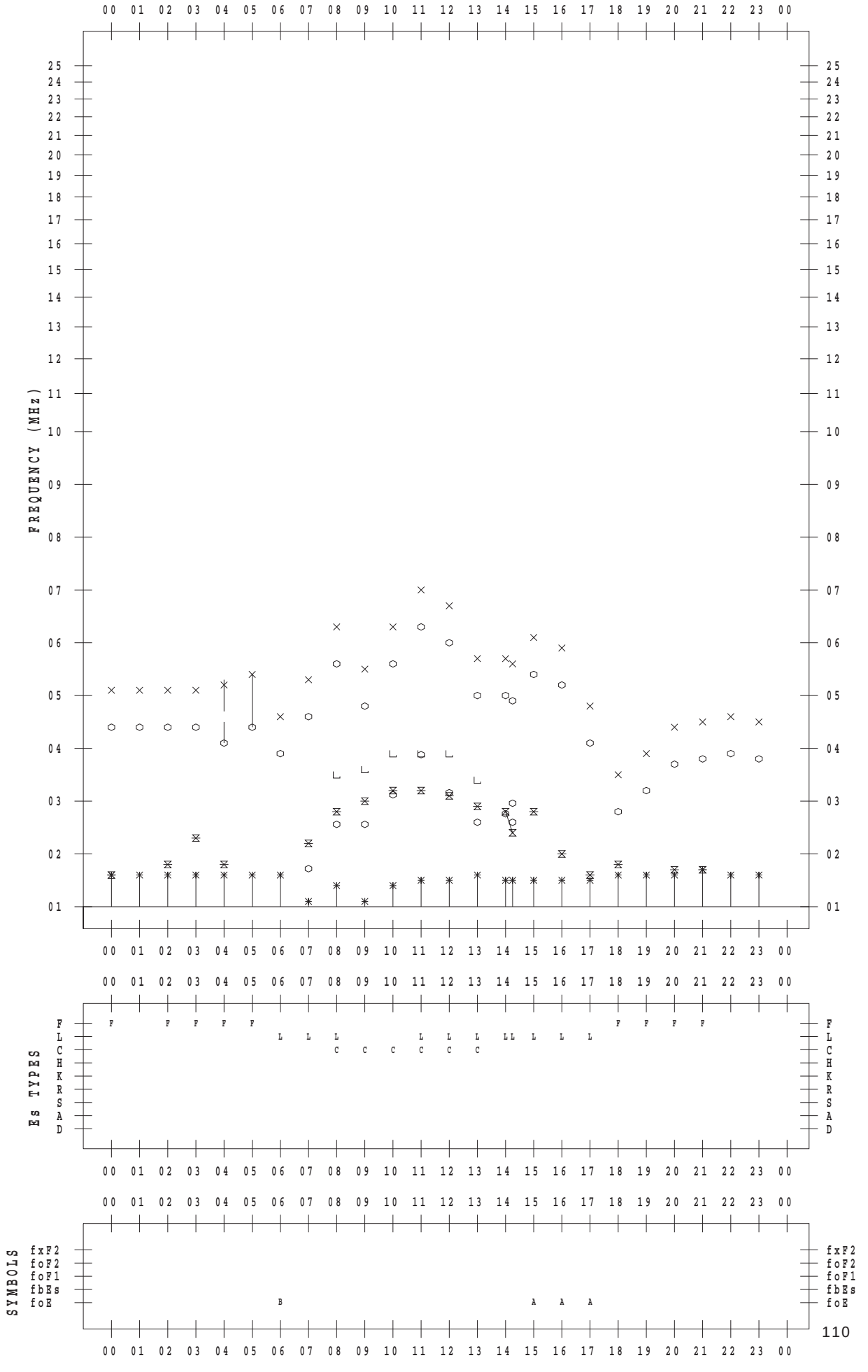
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018/11/ 3

135 °E MEAN TIME



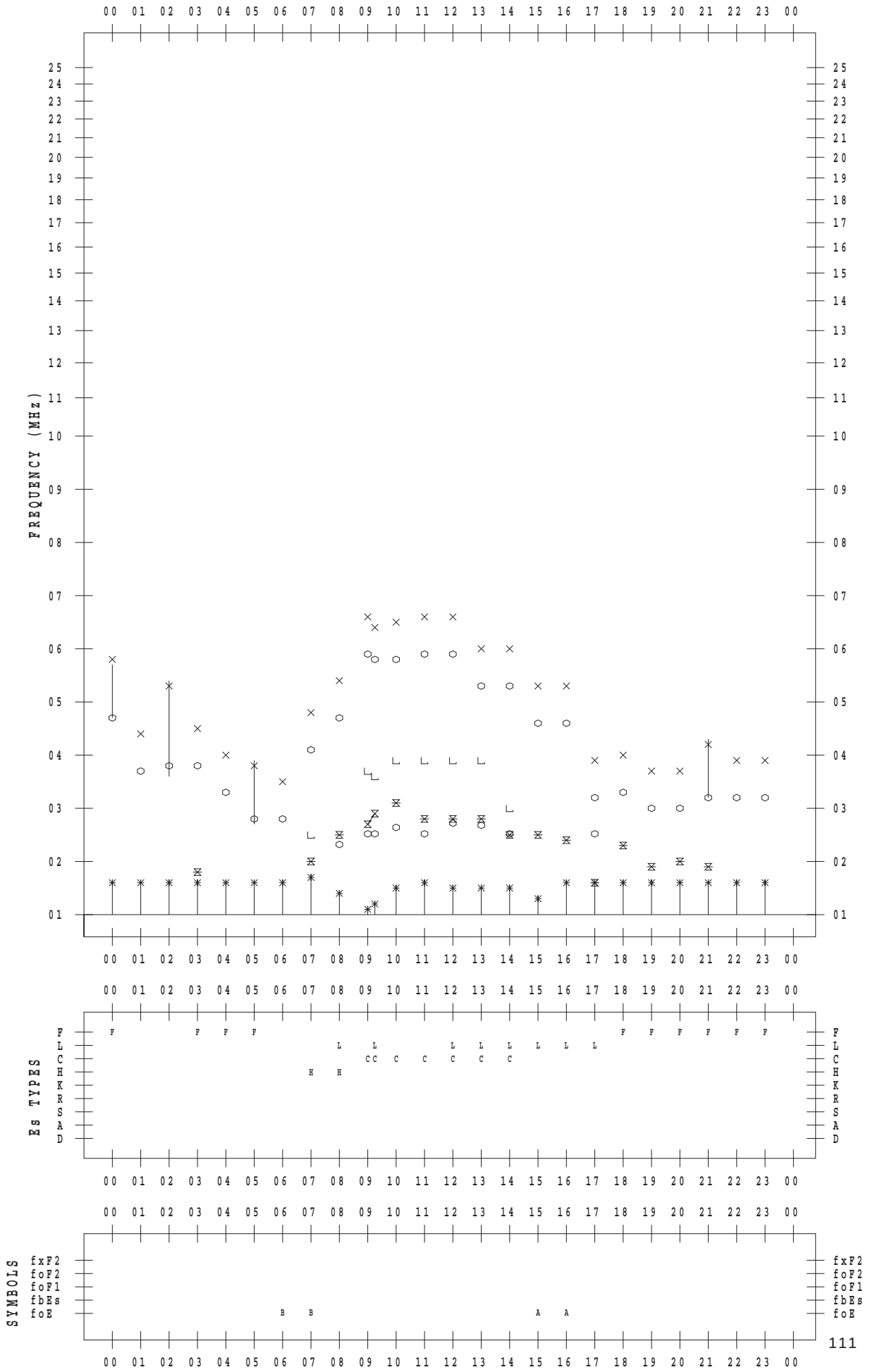
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018/11/ 4

135 °E MEAN TIME



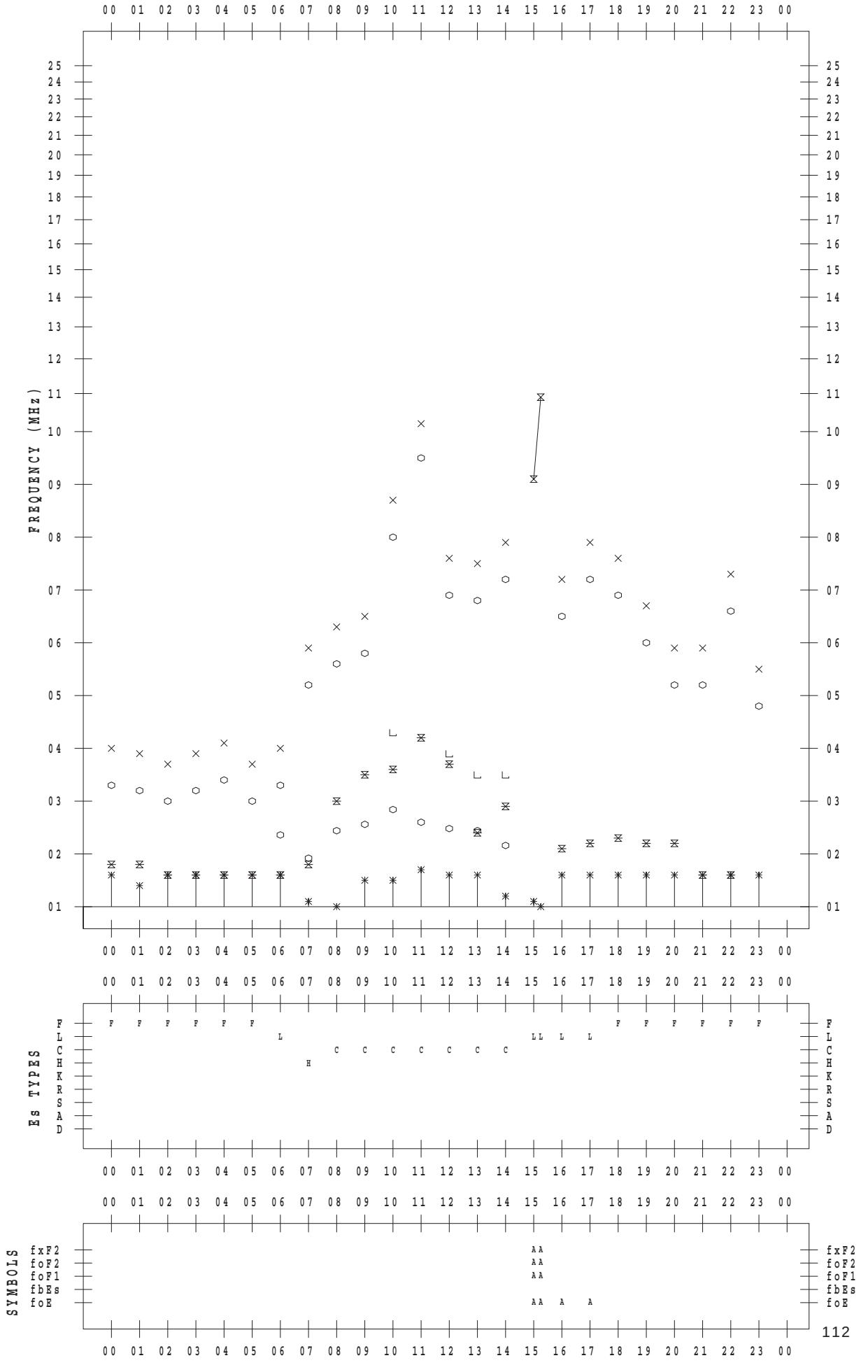
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018/11/ 5

135 °E MEAN TIME



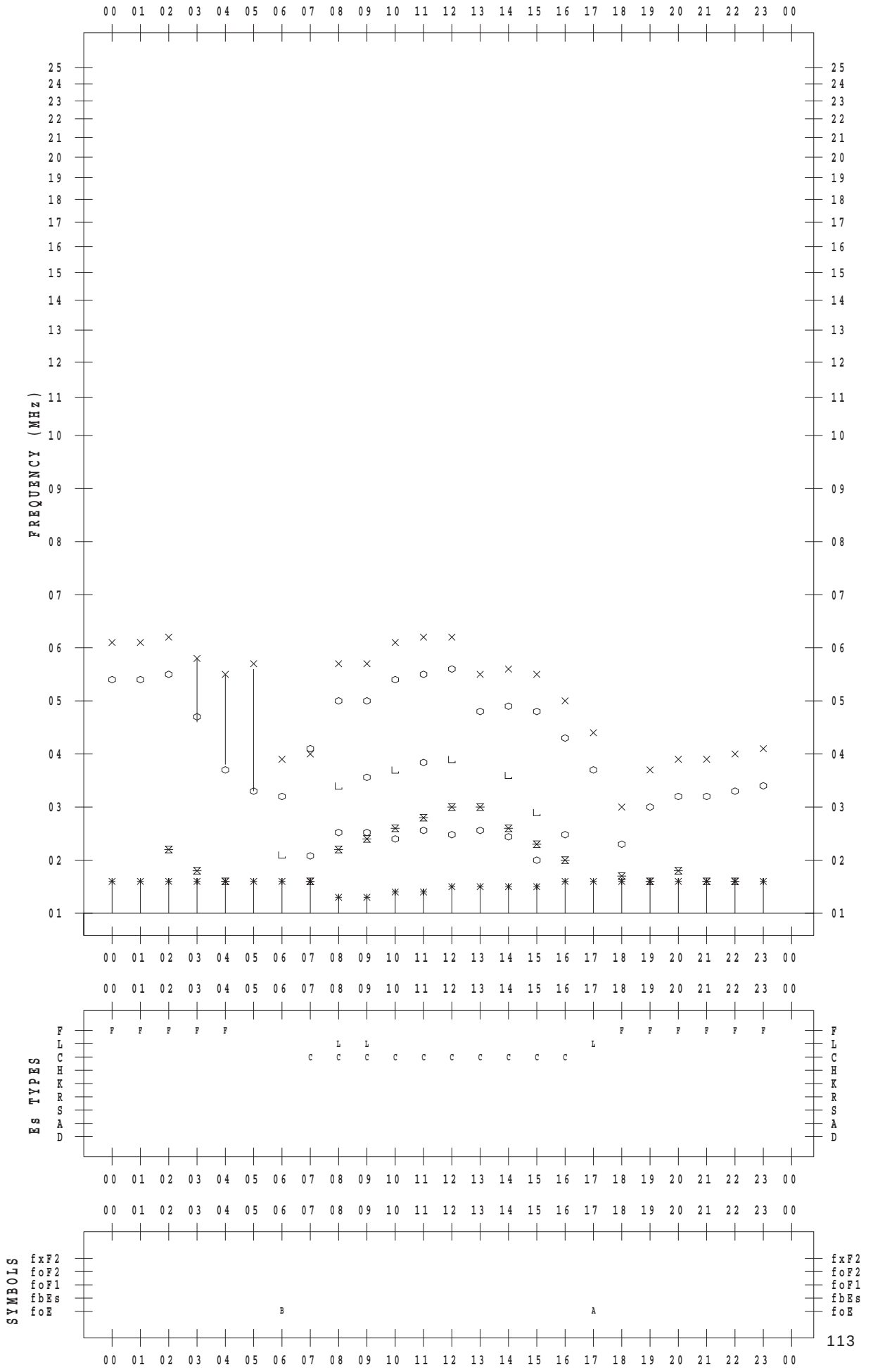
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018/11/ 6

135 °E MEAN TIME



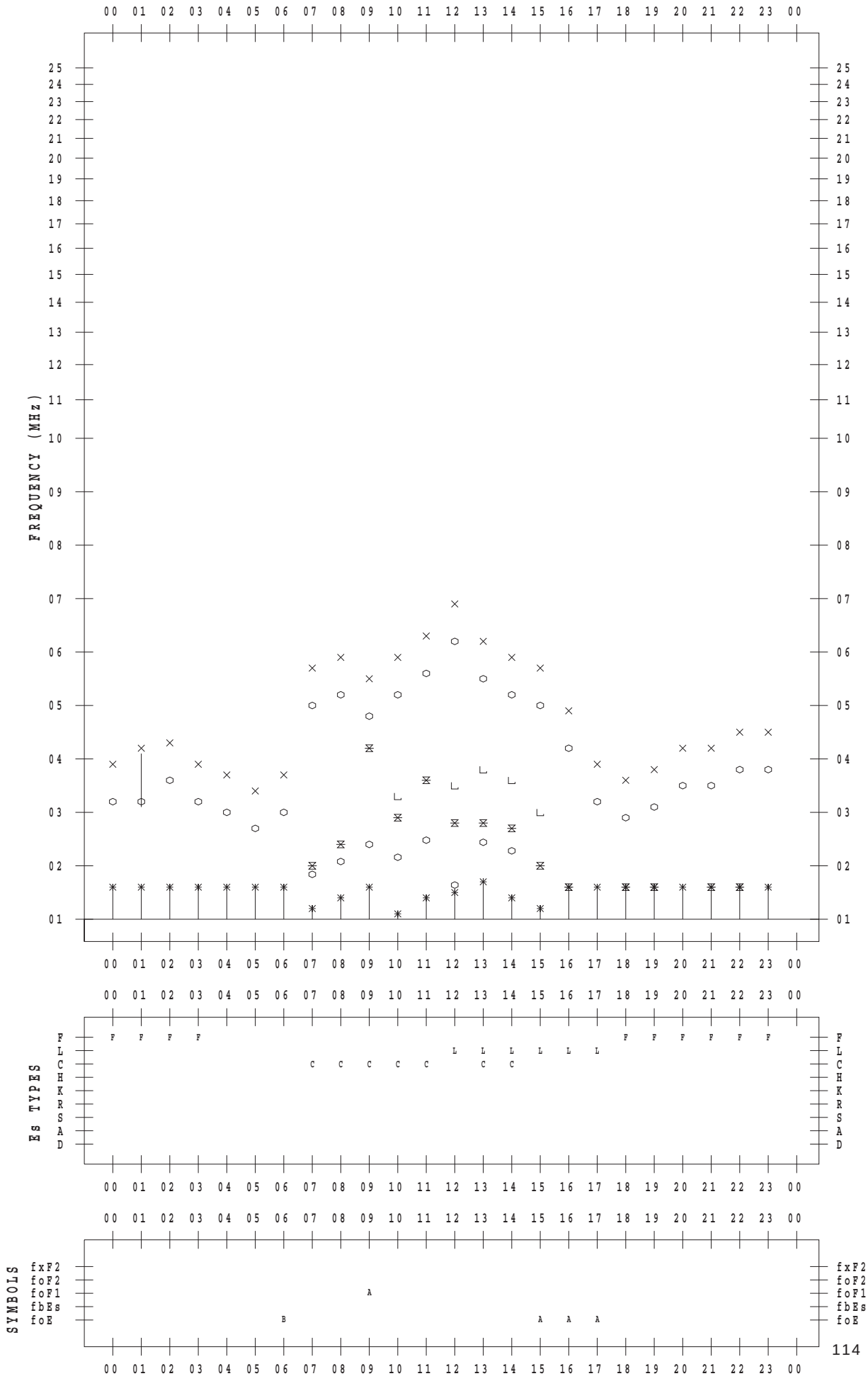
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018/11/ 7

135 °E MEAN TIME



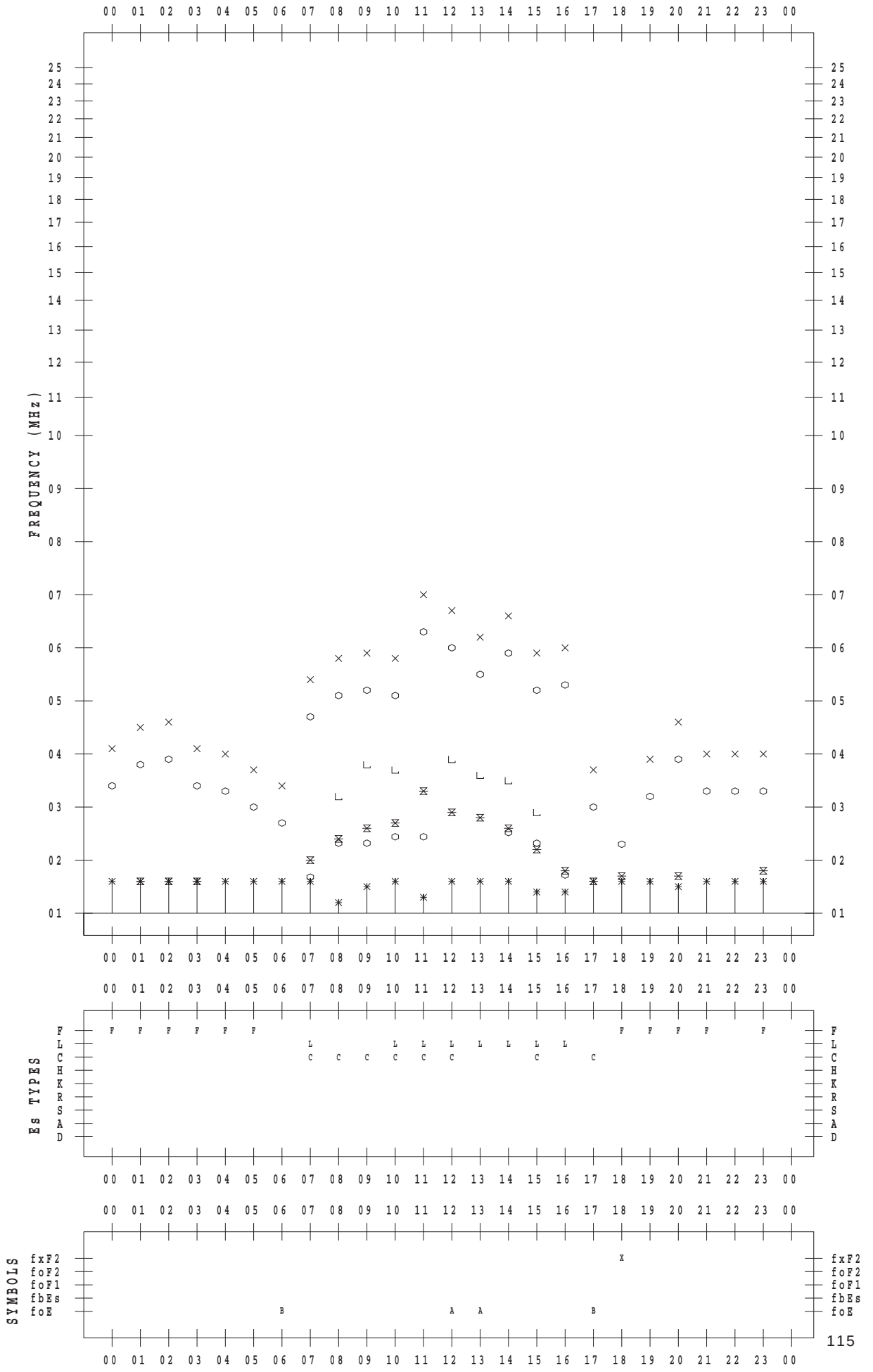
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018/11/ 8

135 °E MEAN TIME



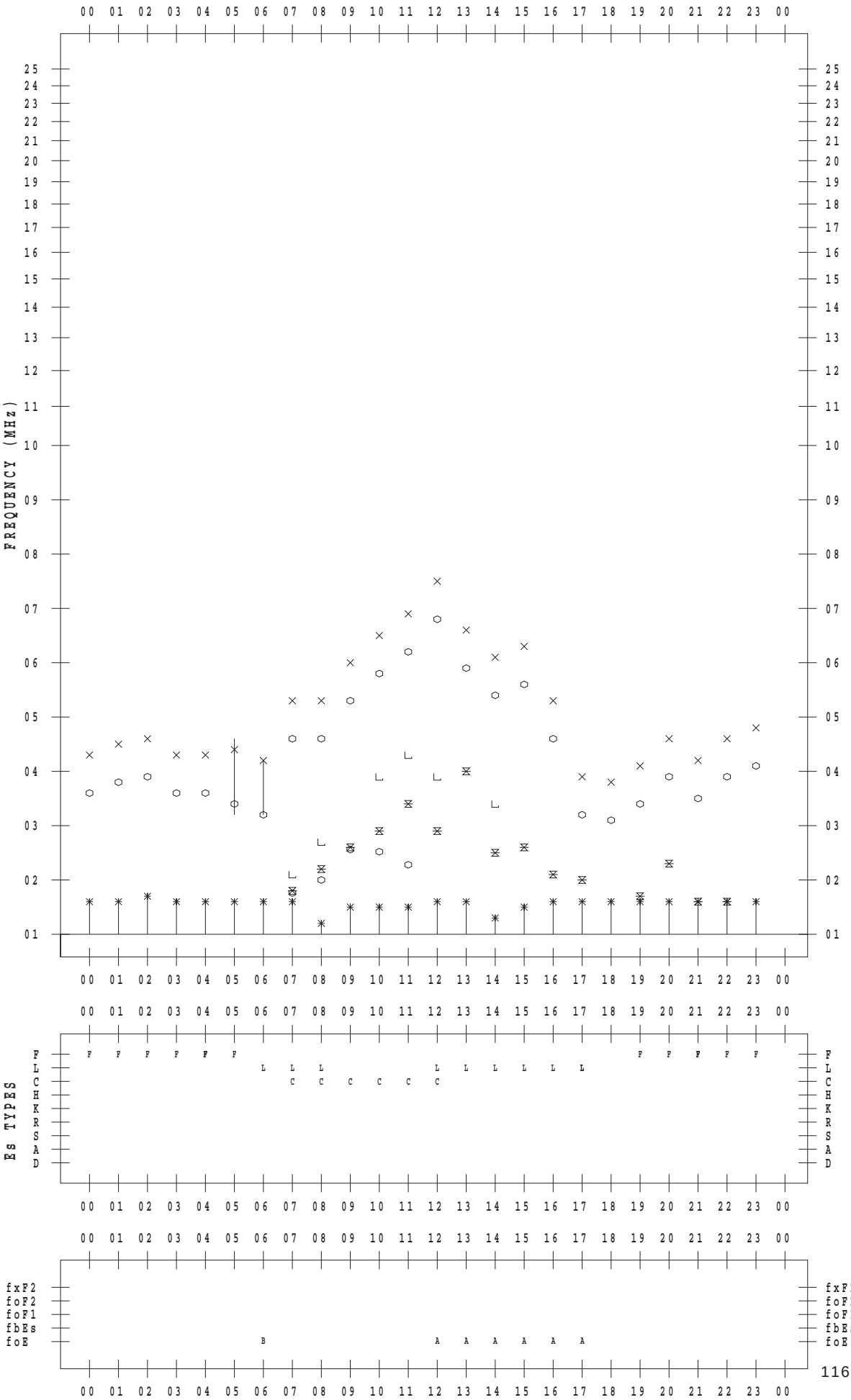
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018/11/ 9

135 °E MEAN TIME



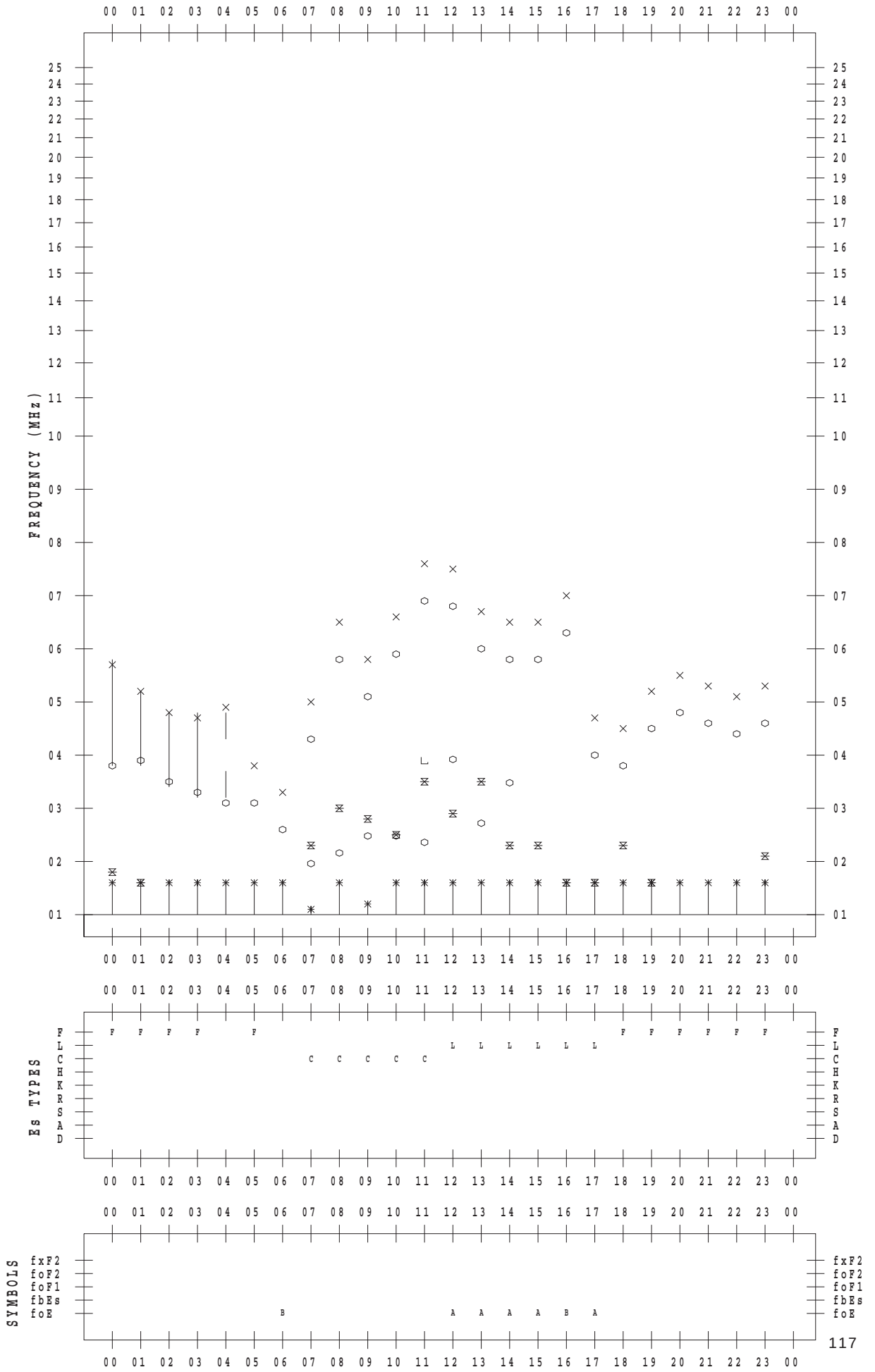
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018/11/10

135 °E MEAN TIME



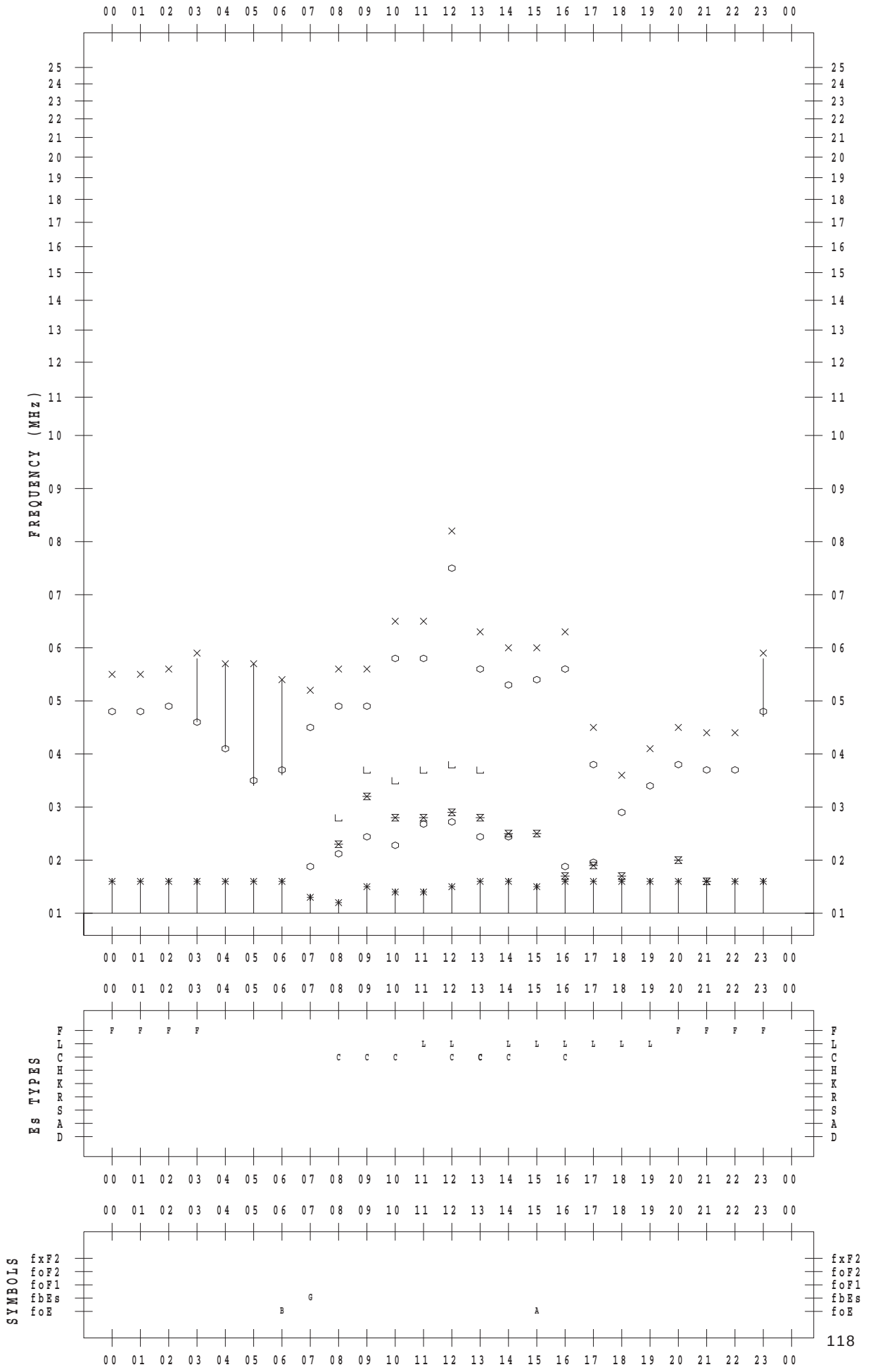
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018/11/11

135 °E MEAN TIME



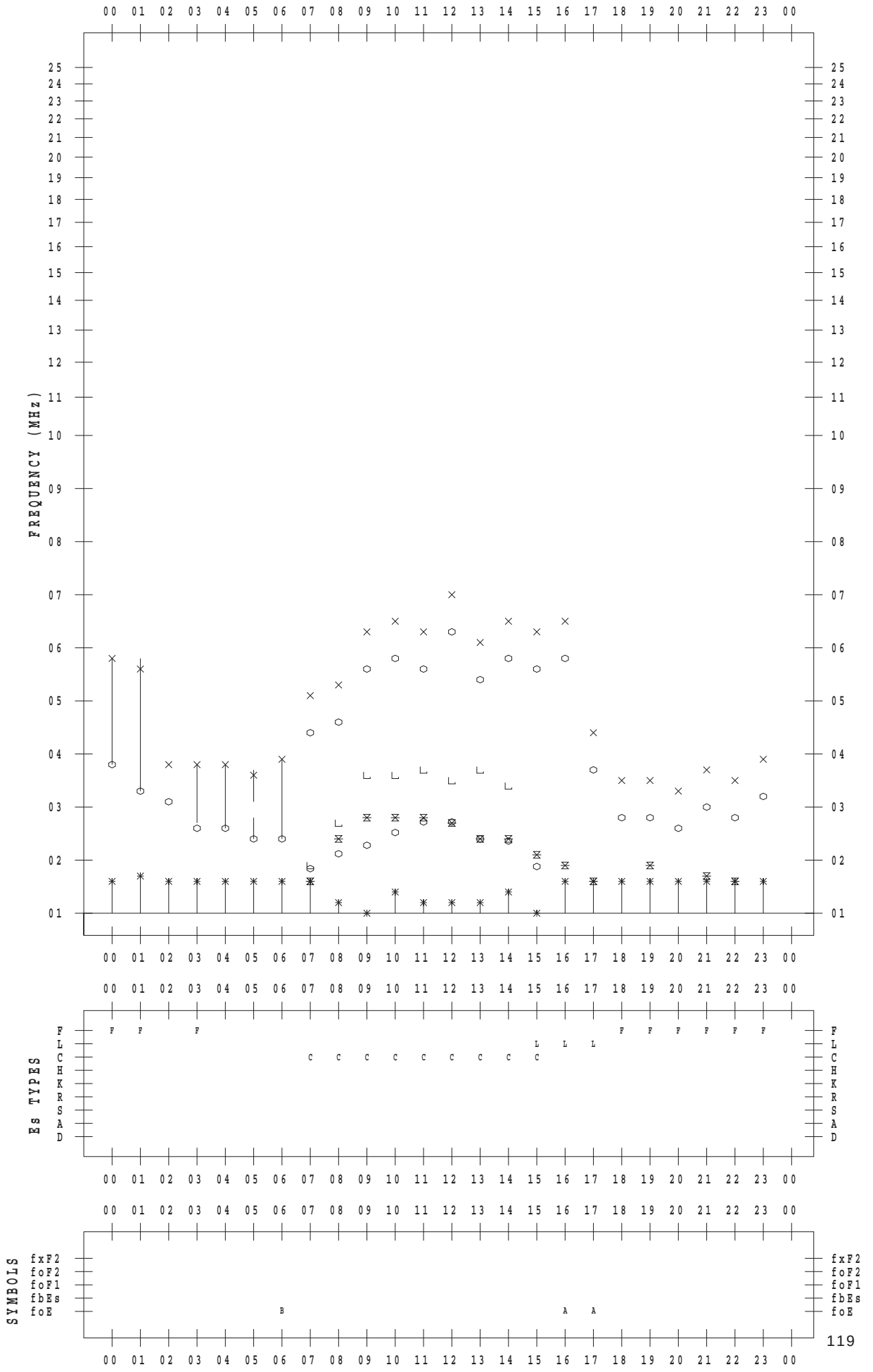
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018/11/12

135 °E MEAN TIME



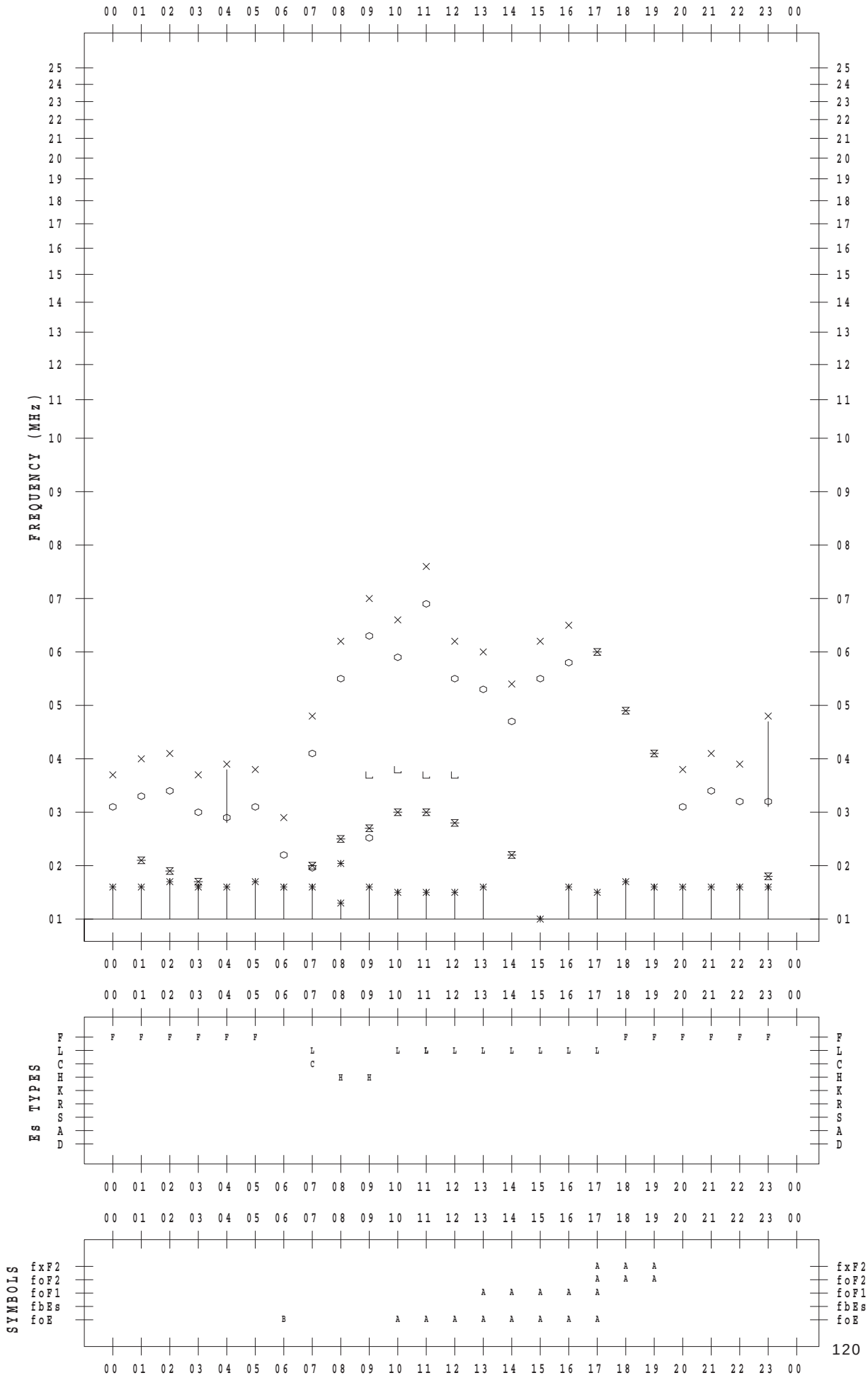
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018/11/13

135 °E MEAN TIME



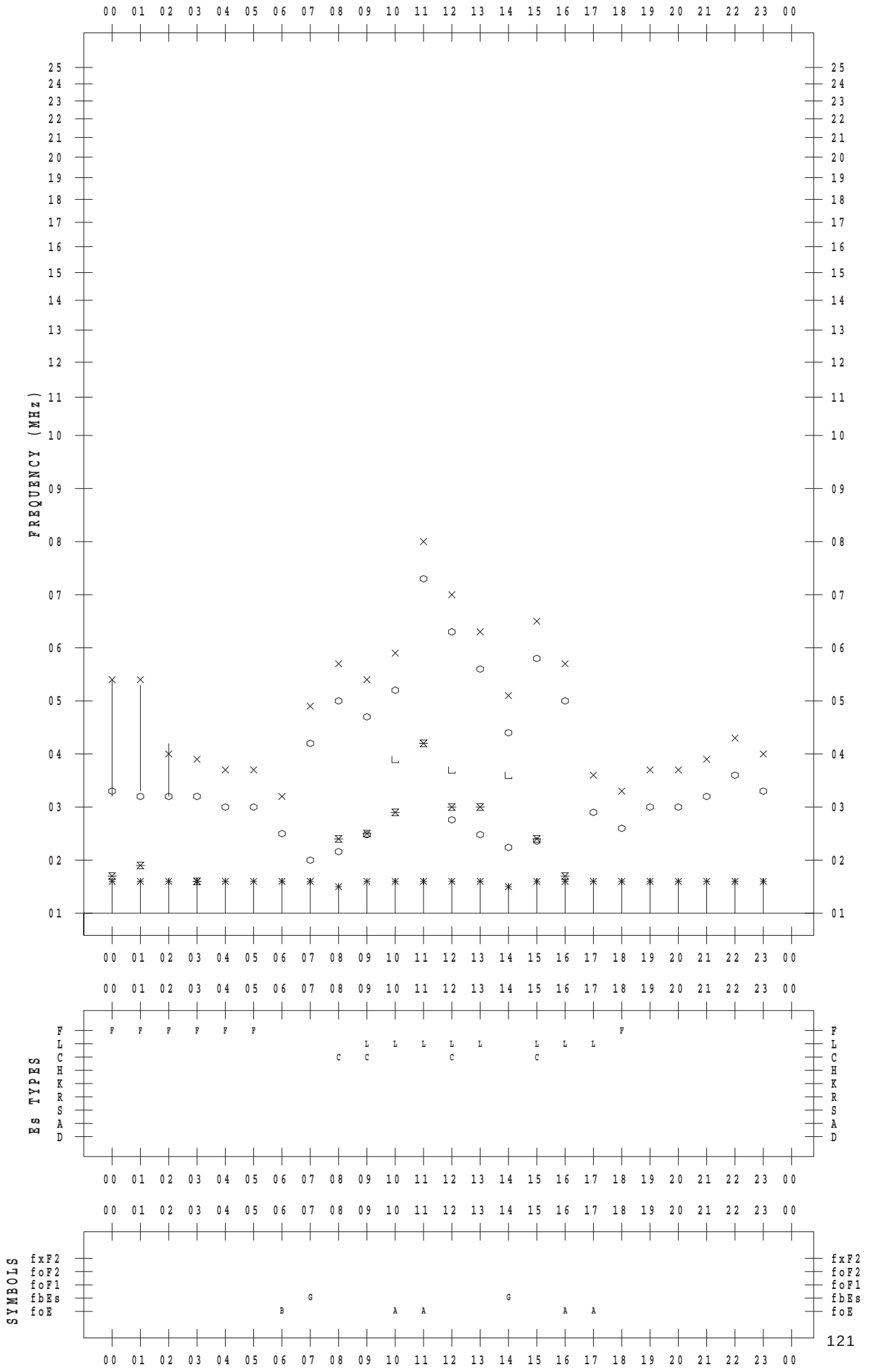
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018/11/14

135 °E MEAN TIME



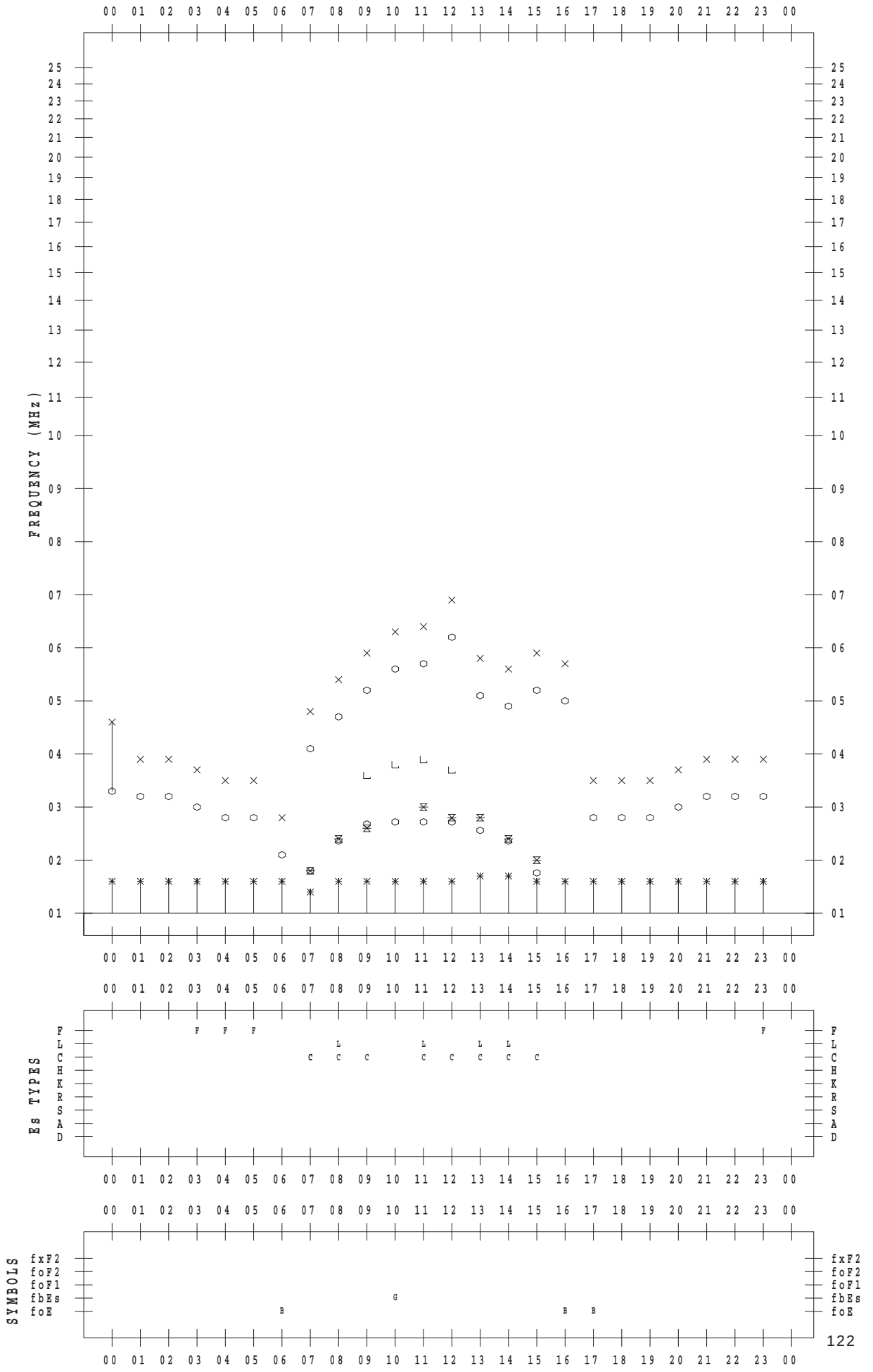
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018/11/15

135 °E MEAN TIME



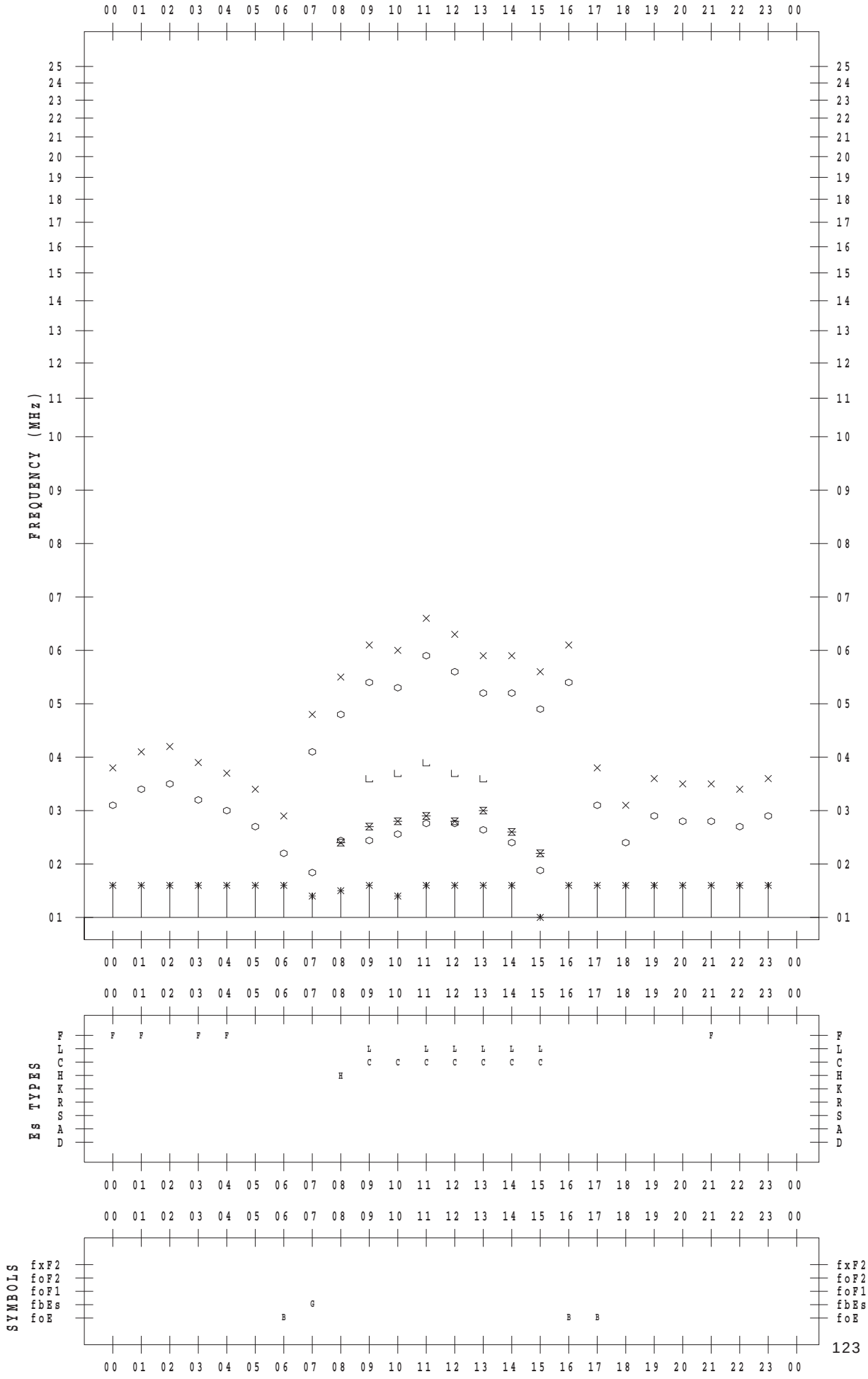
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018/11/16

135 °E MEAN TIME



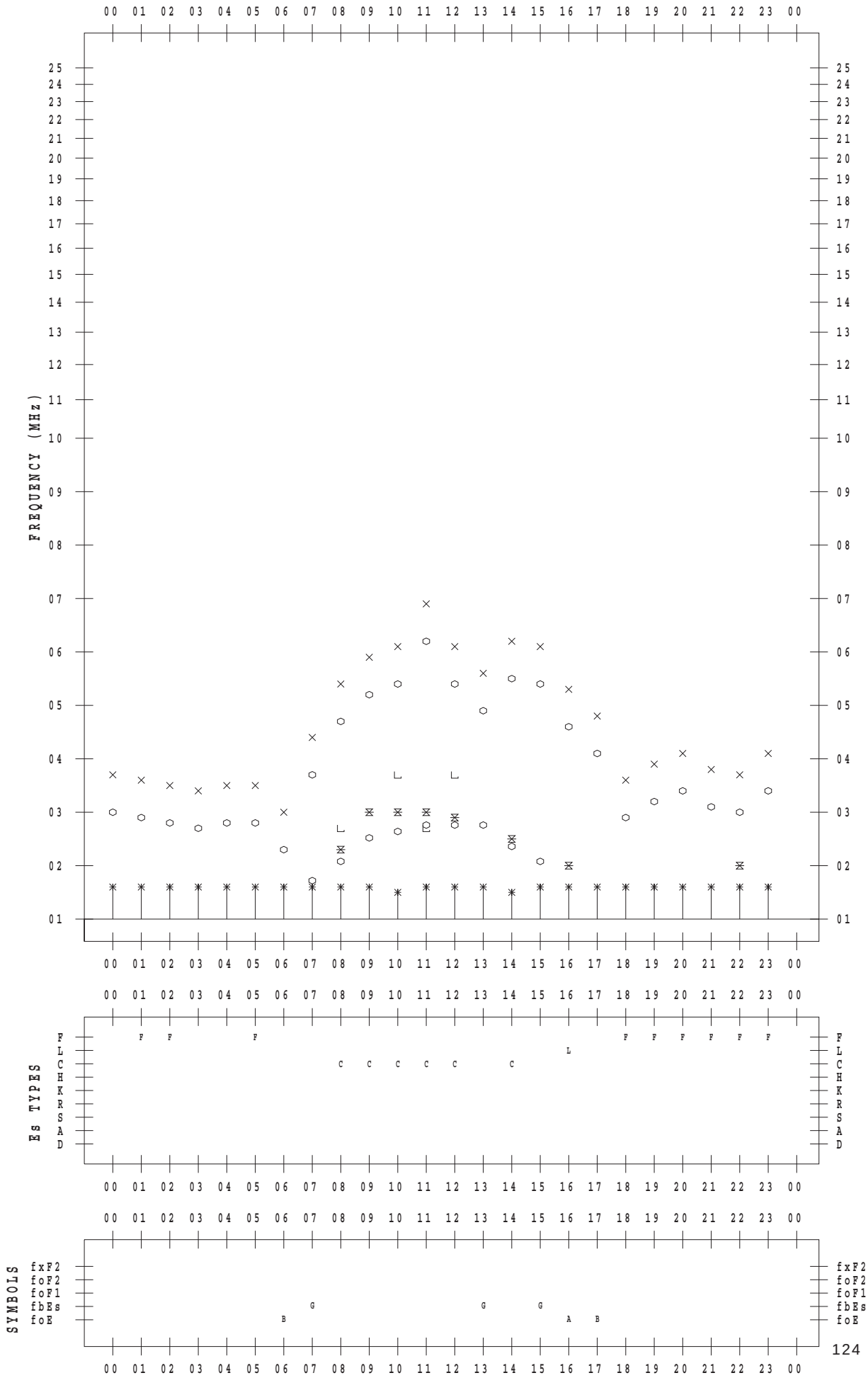
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018/11/17

135 °E MEAN TIME



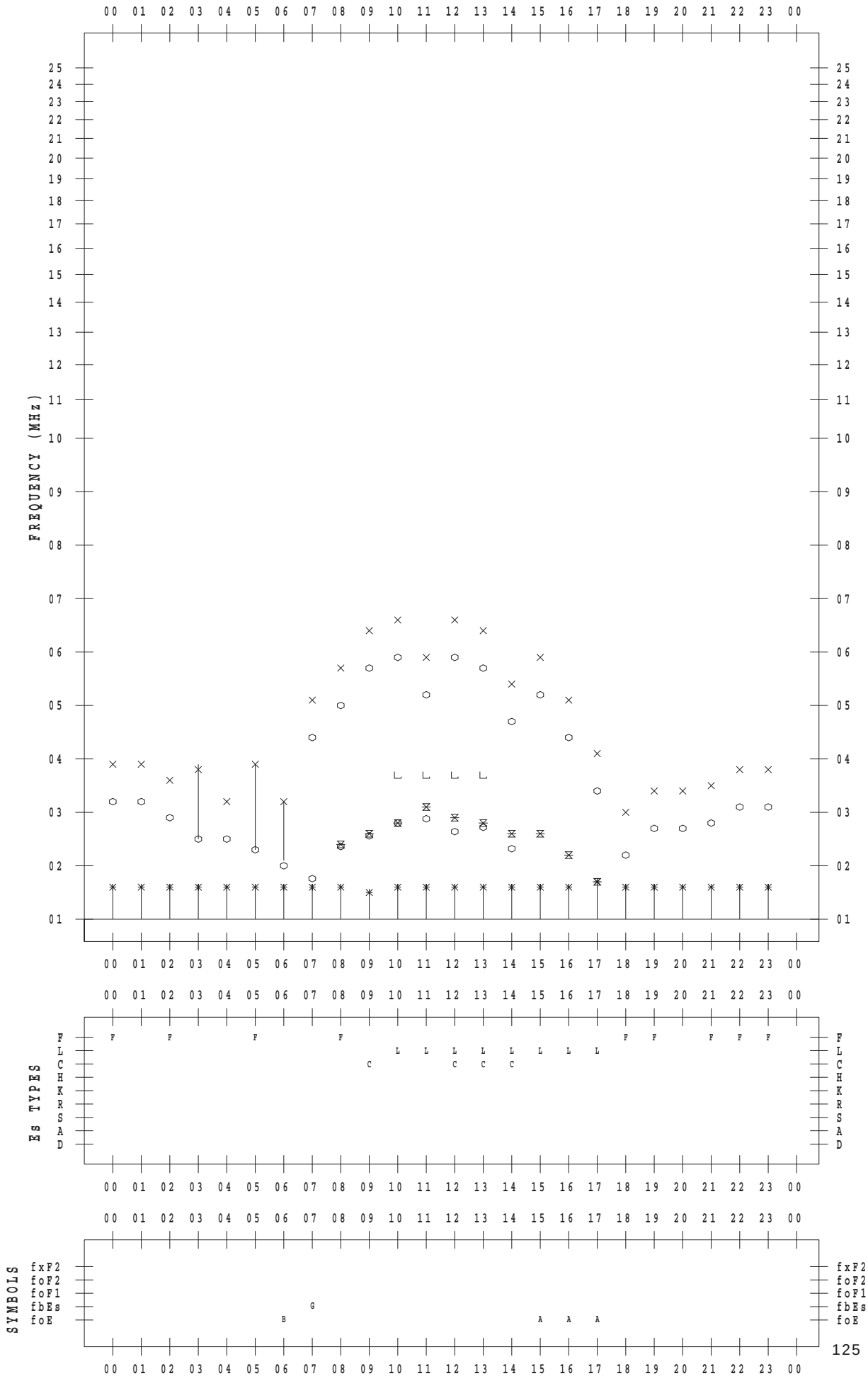
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018/11/18

135 °E MEAN TIME



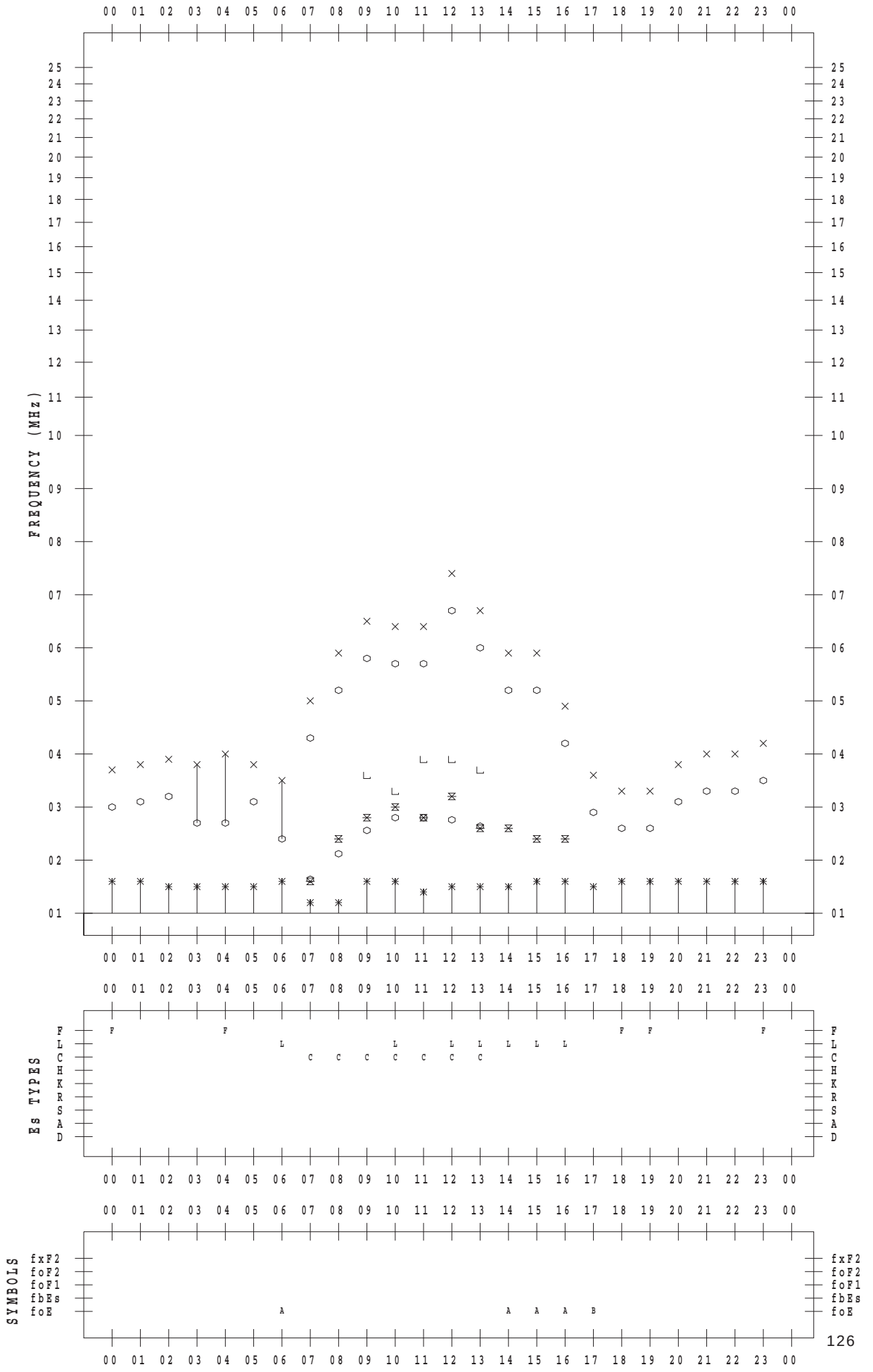
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018/11/19

135 °E MEAN TIME



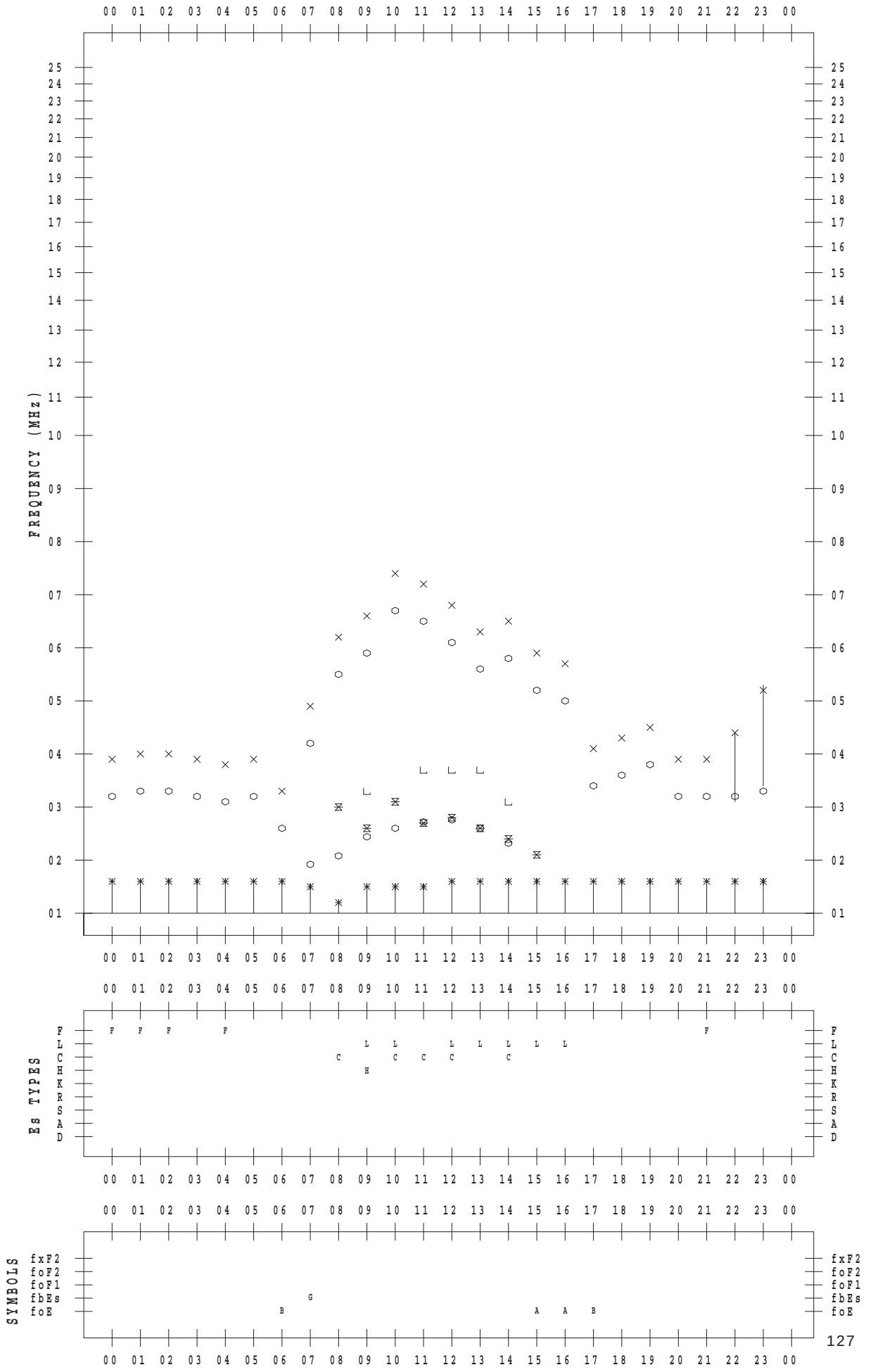
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018/11/20

135 °E MEAN TIME



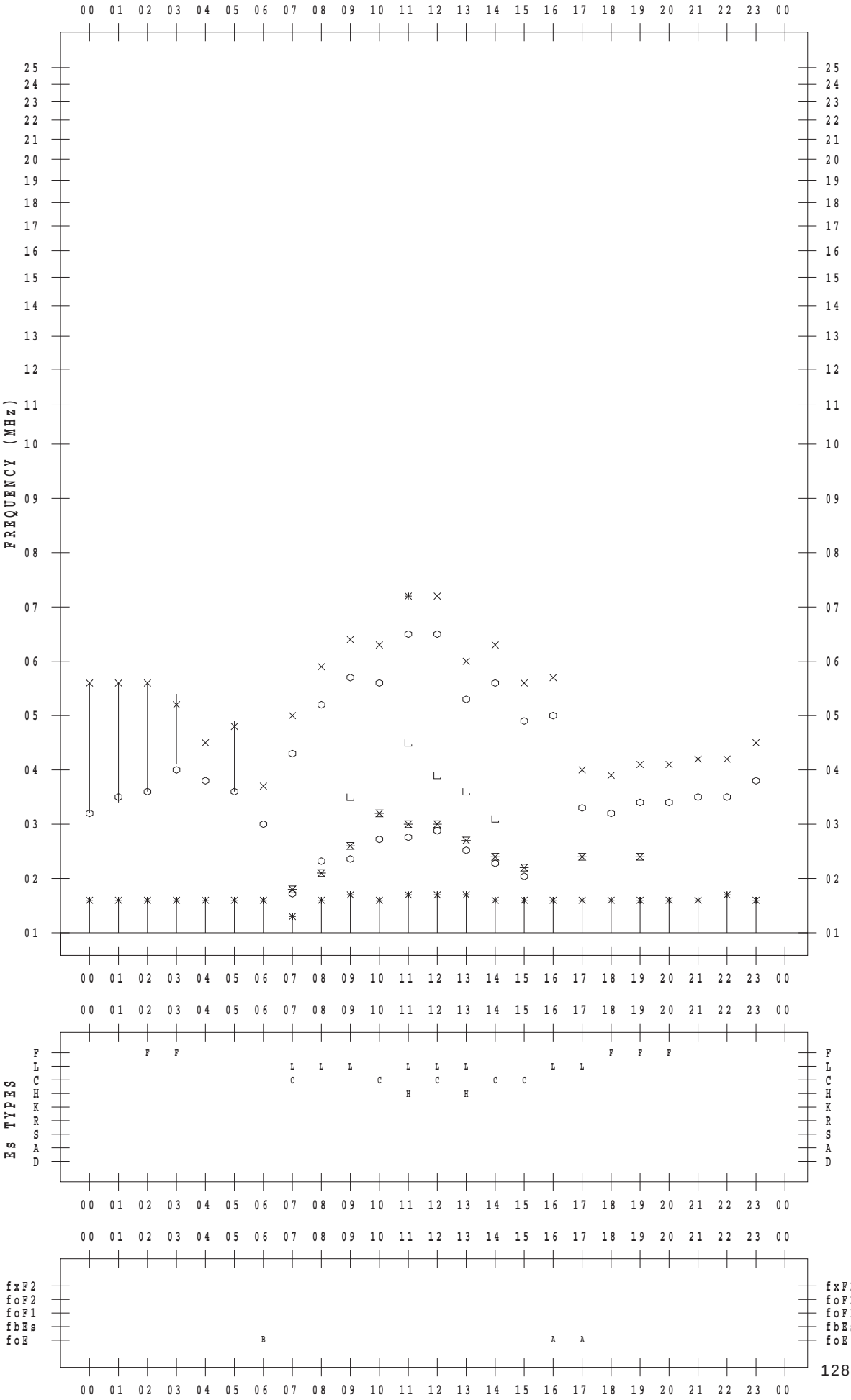
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018/11/21

135 °E MEAN TIME



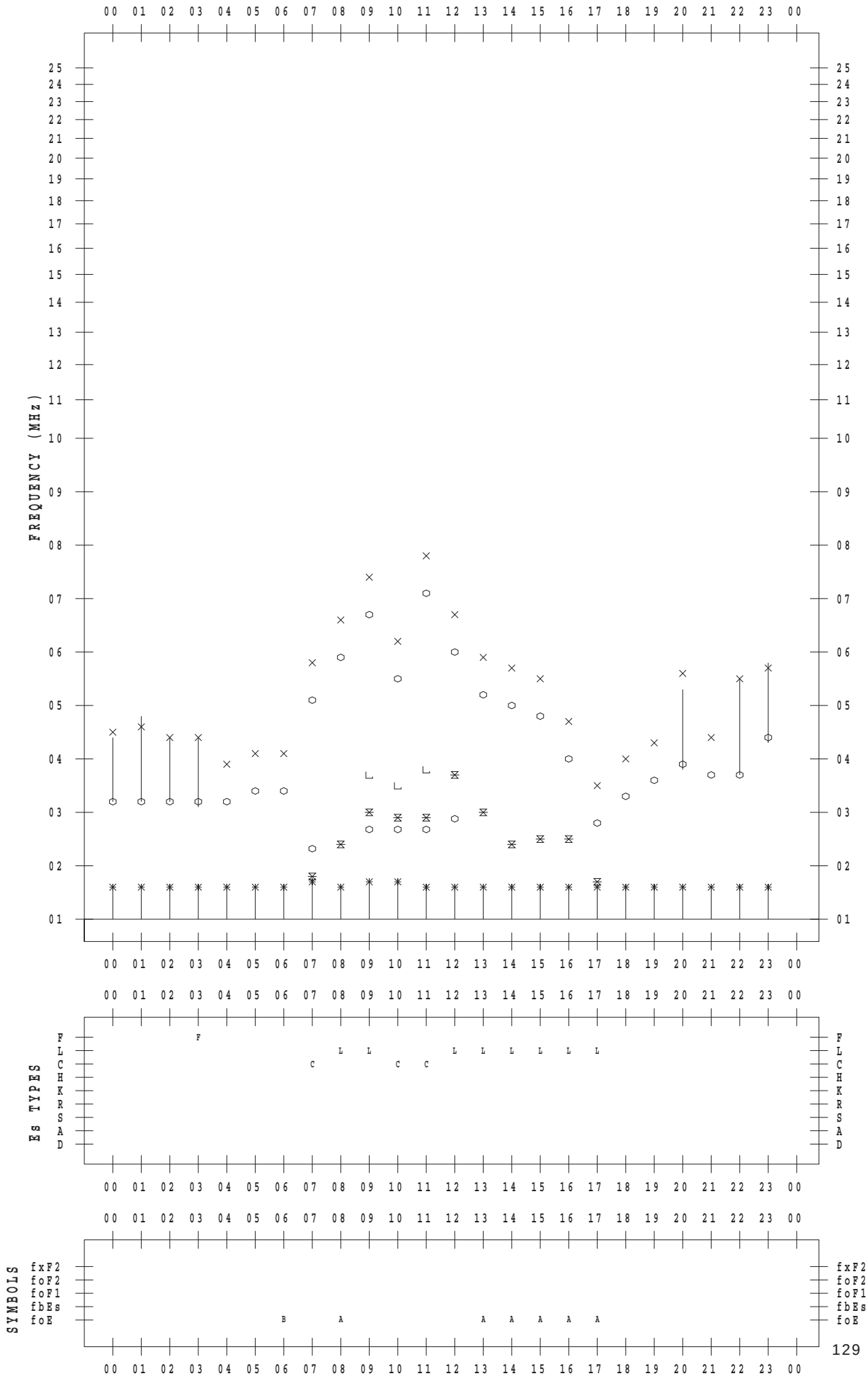
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018/11/22

135 °E MEAN TIME



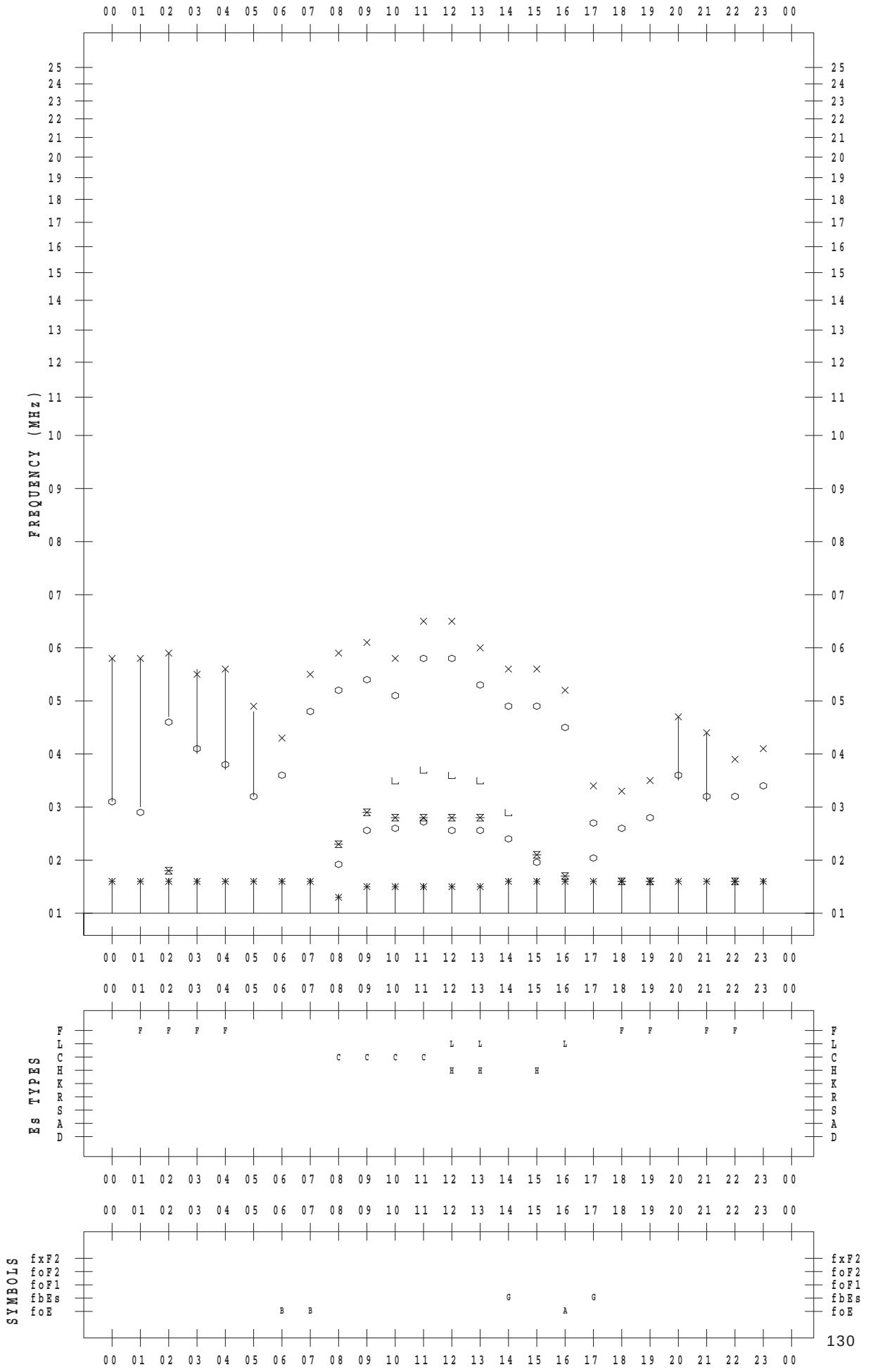
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018/11/23

135 °E MEAN TIME



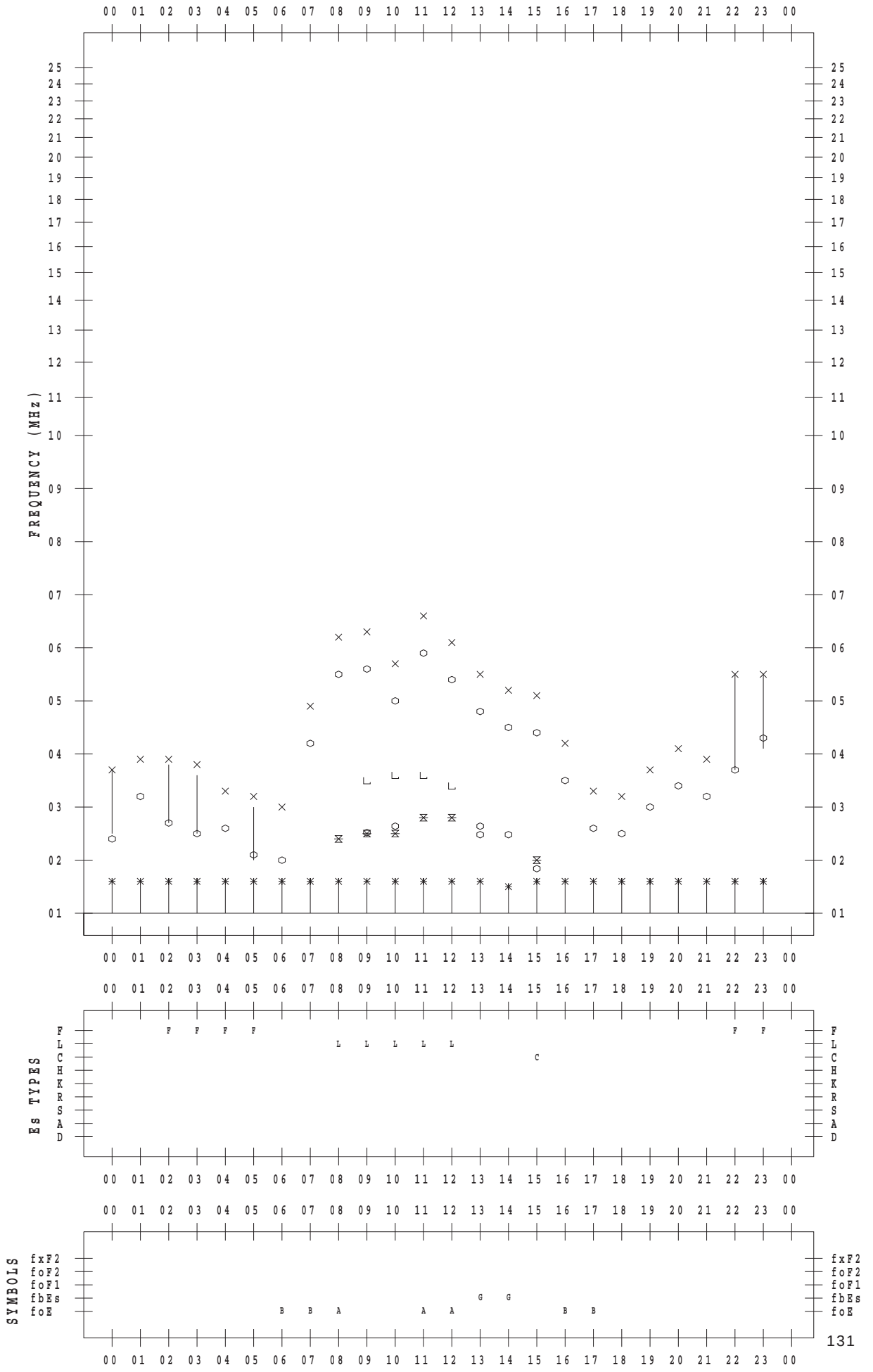
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018/11/24

135 °E MEAN TIME



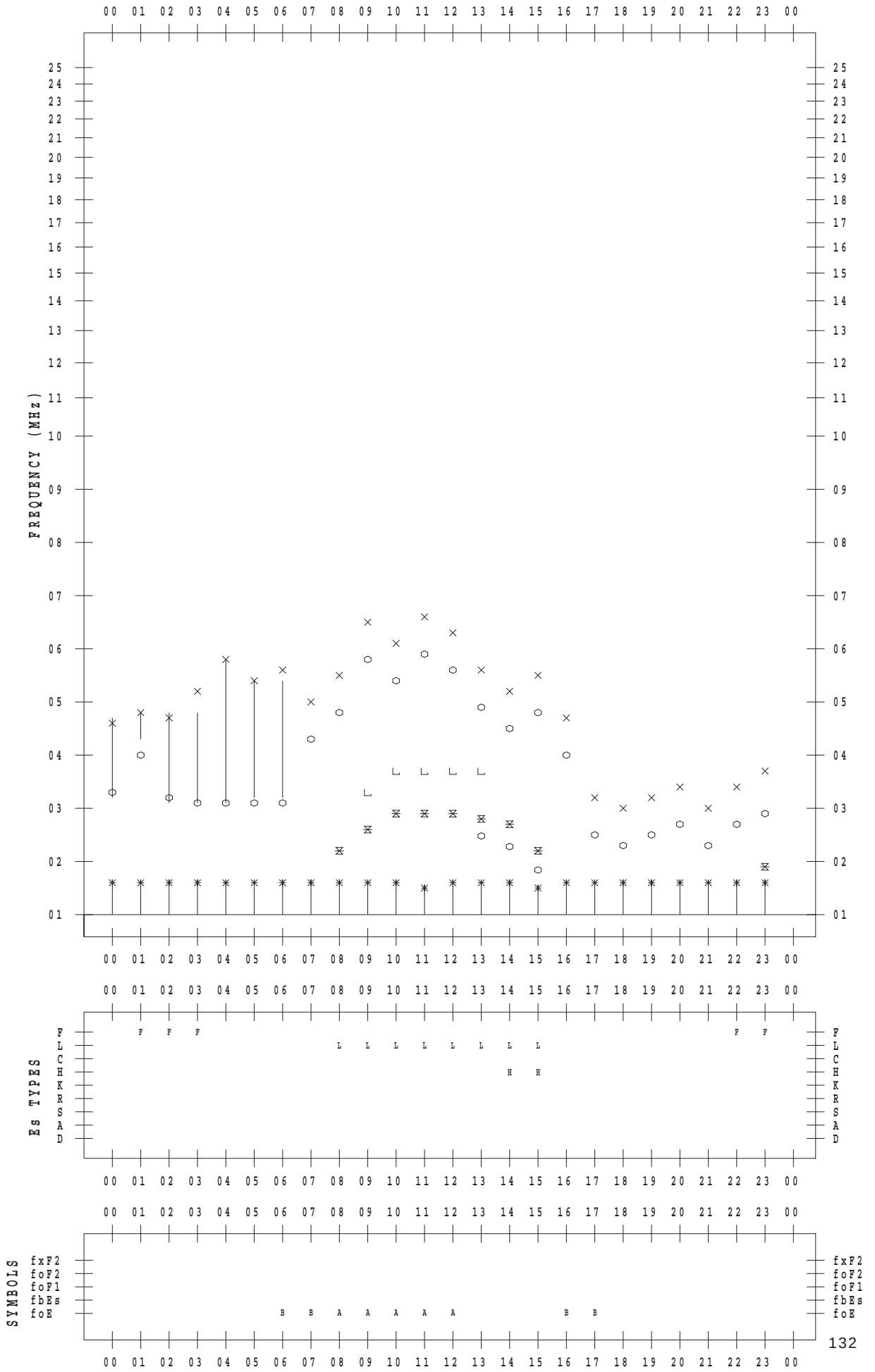
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018/11/25

135 °E MEAN TIME



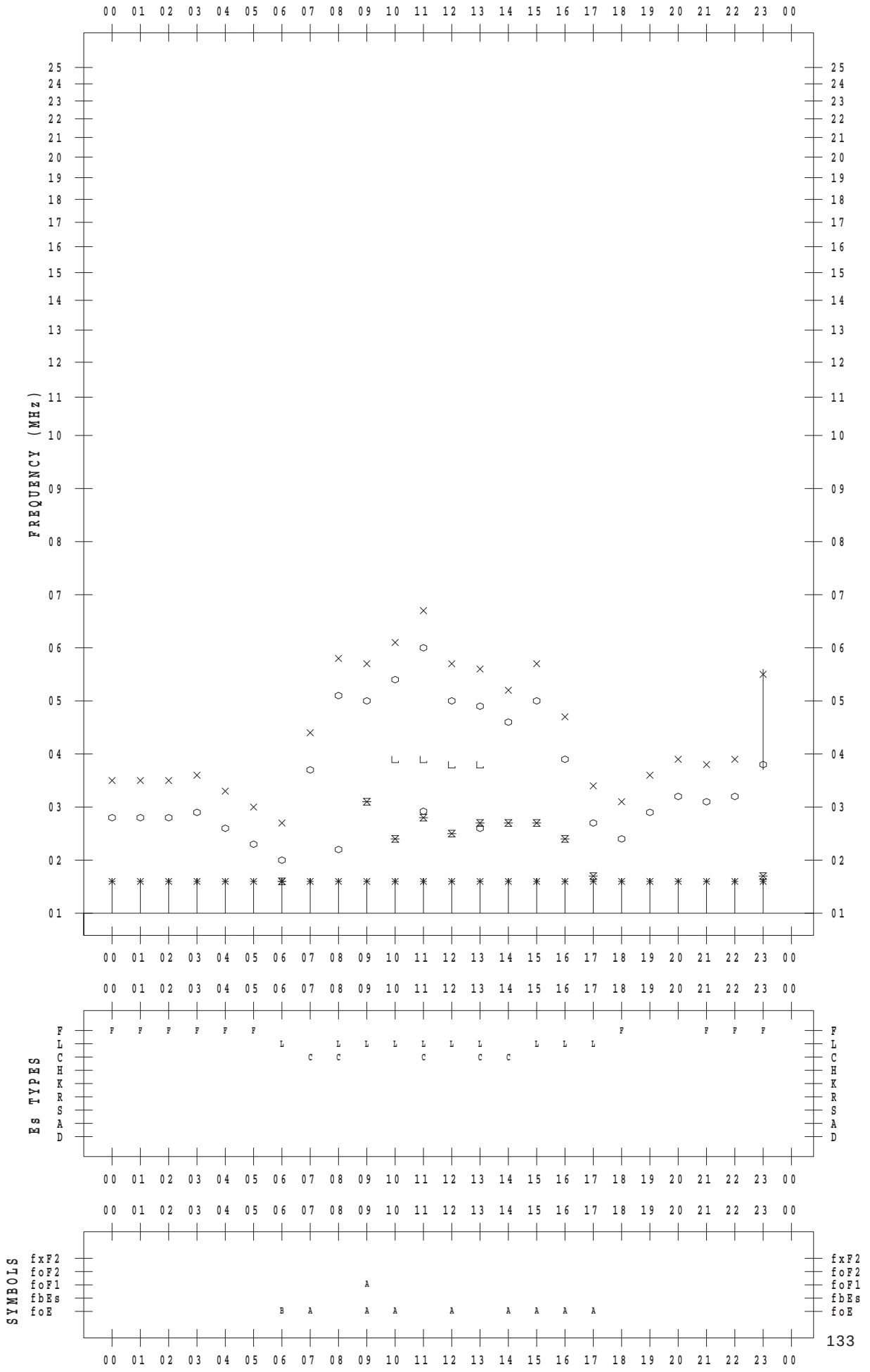
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018/11/26

135 °E MEAN TIME



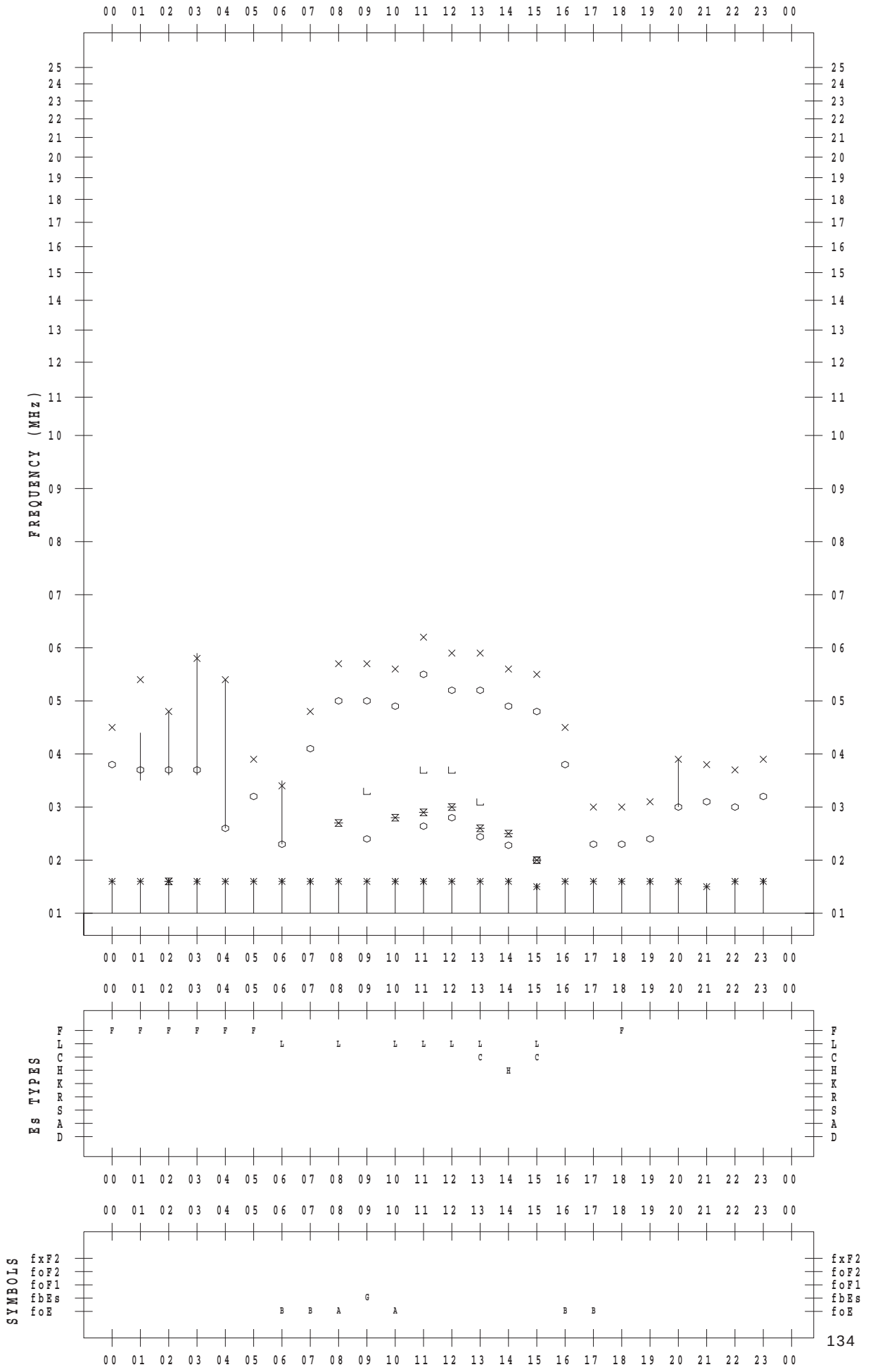
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018/11/27

135 °E MEAN TIME



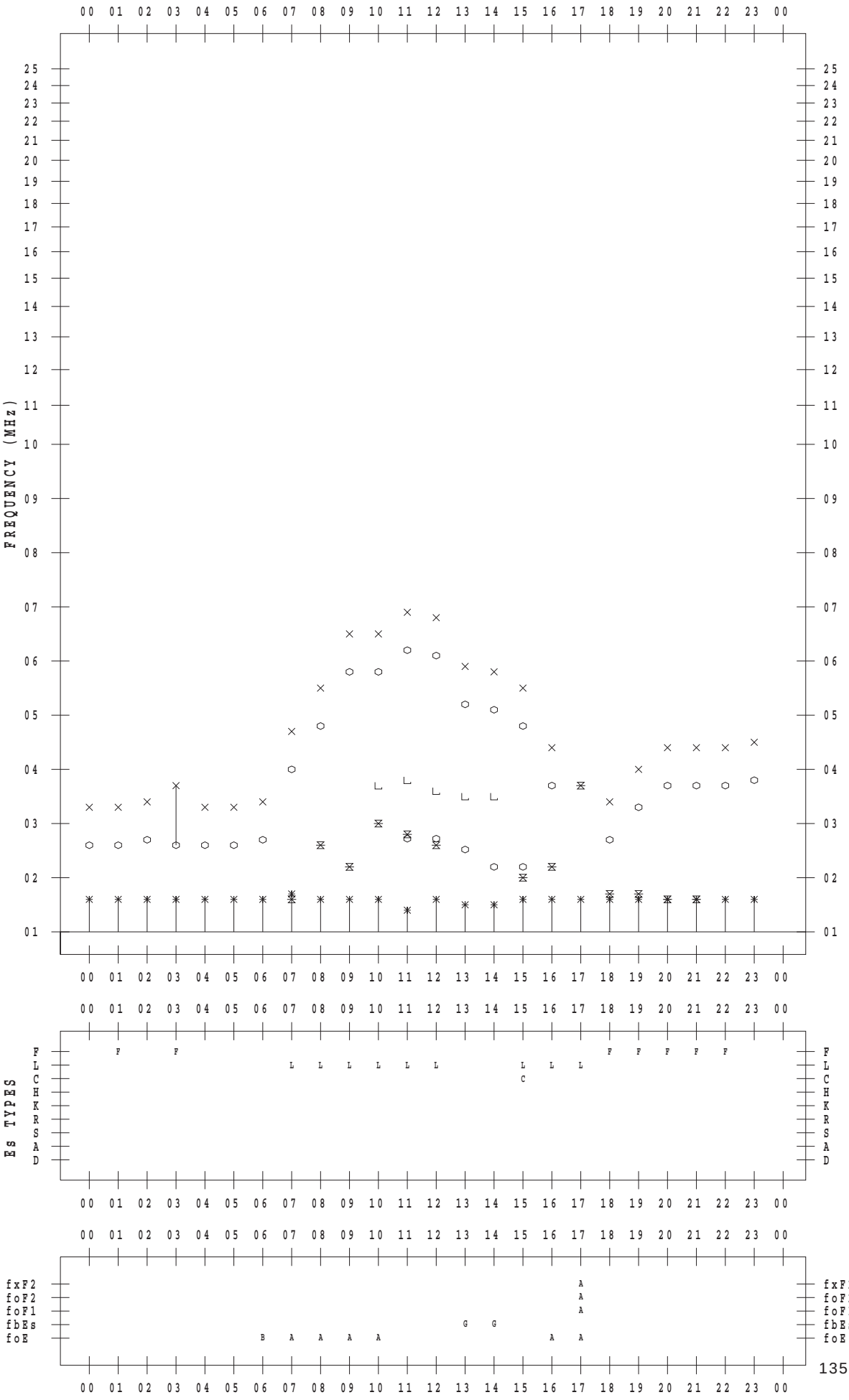
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018/11/28

135 °E MEAN TIME



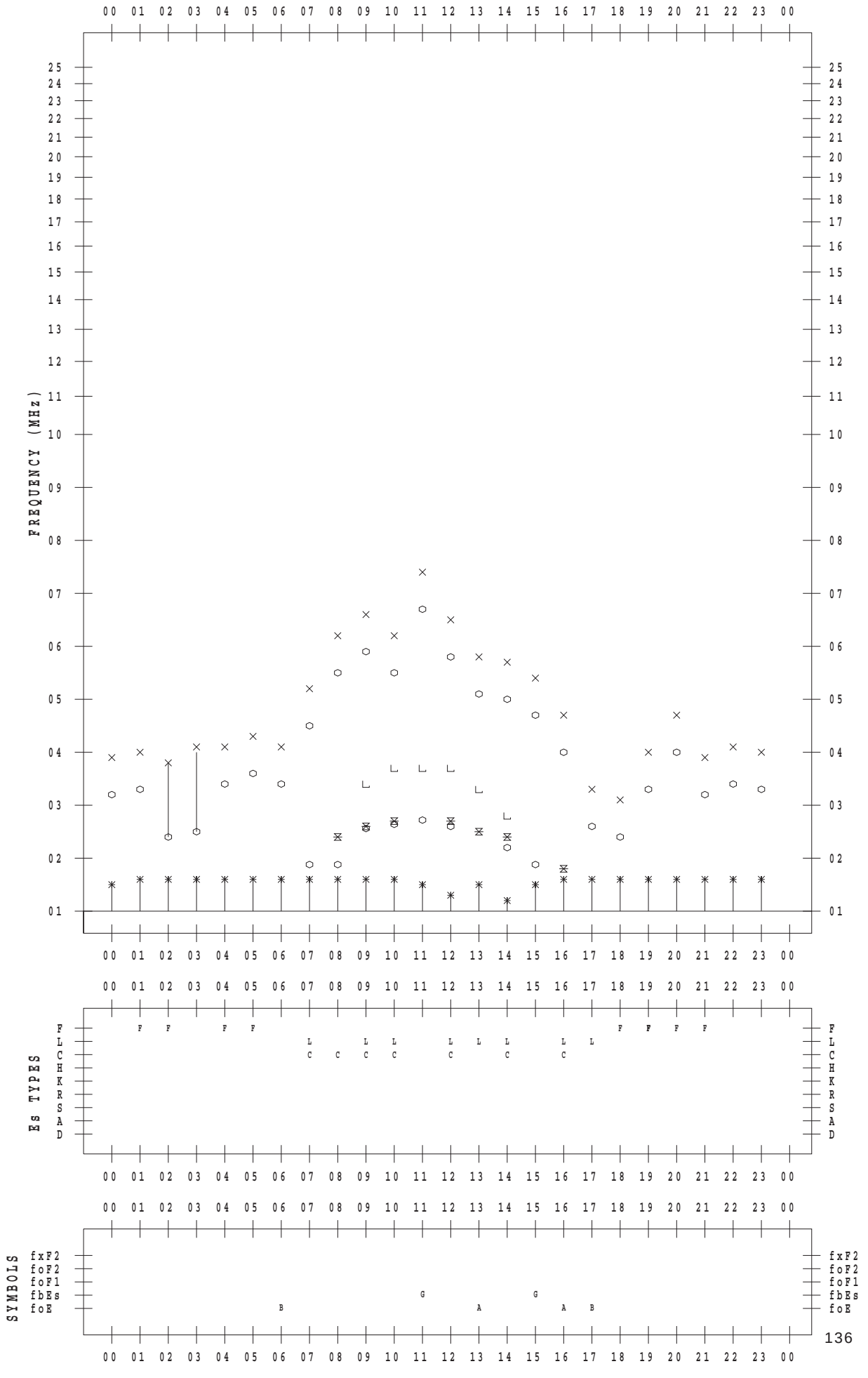
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018/11/29

135 °E MEAN TIME



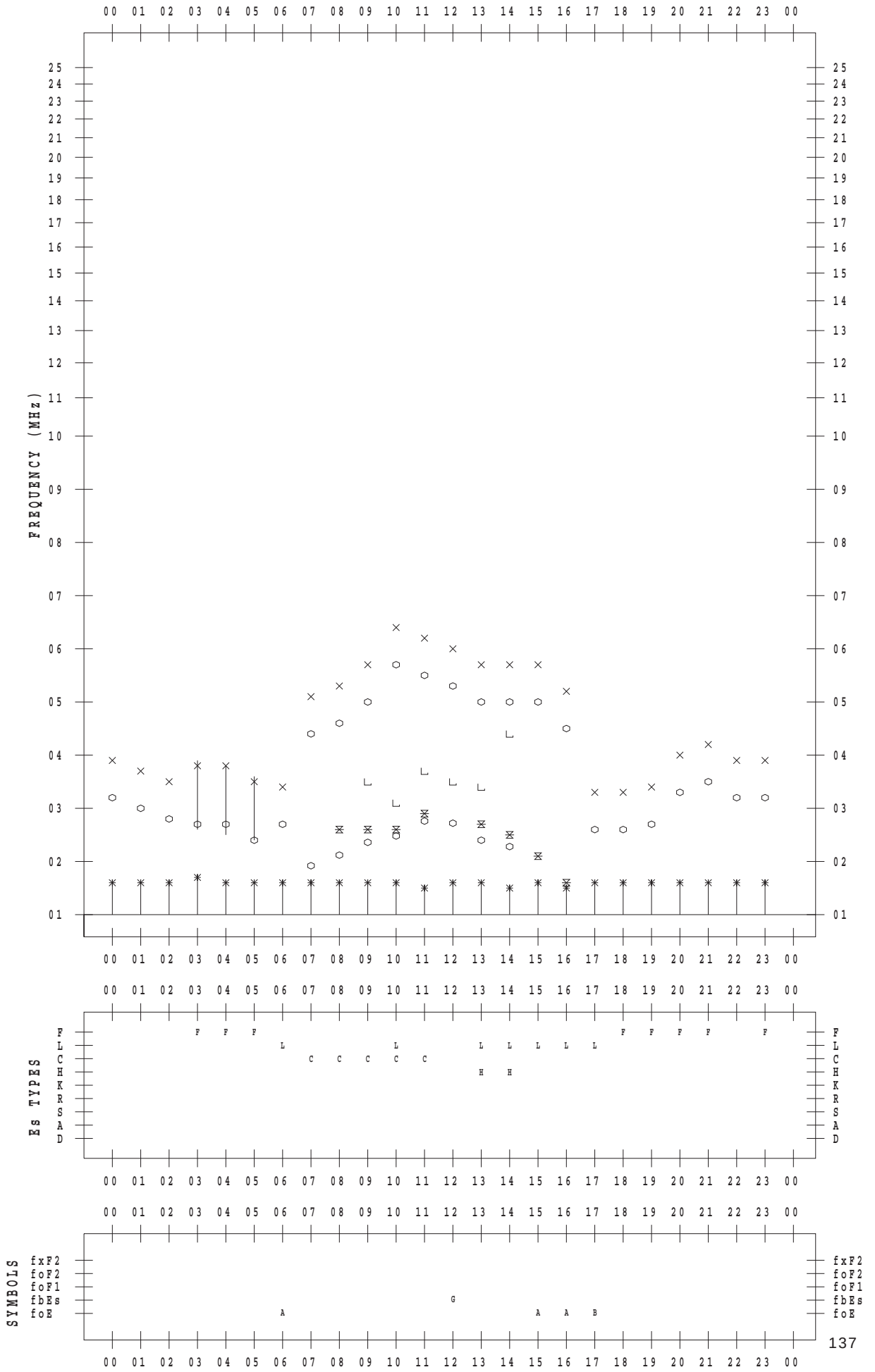
f-PLOT DATA

SCALER : K.FUKUSHIMA

STATION : Wakkanai

DATE : 2018/11/30

135 °E MEAN TIME



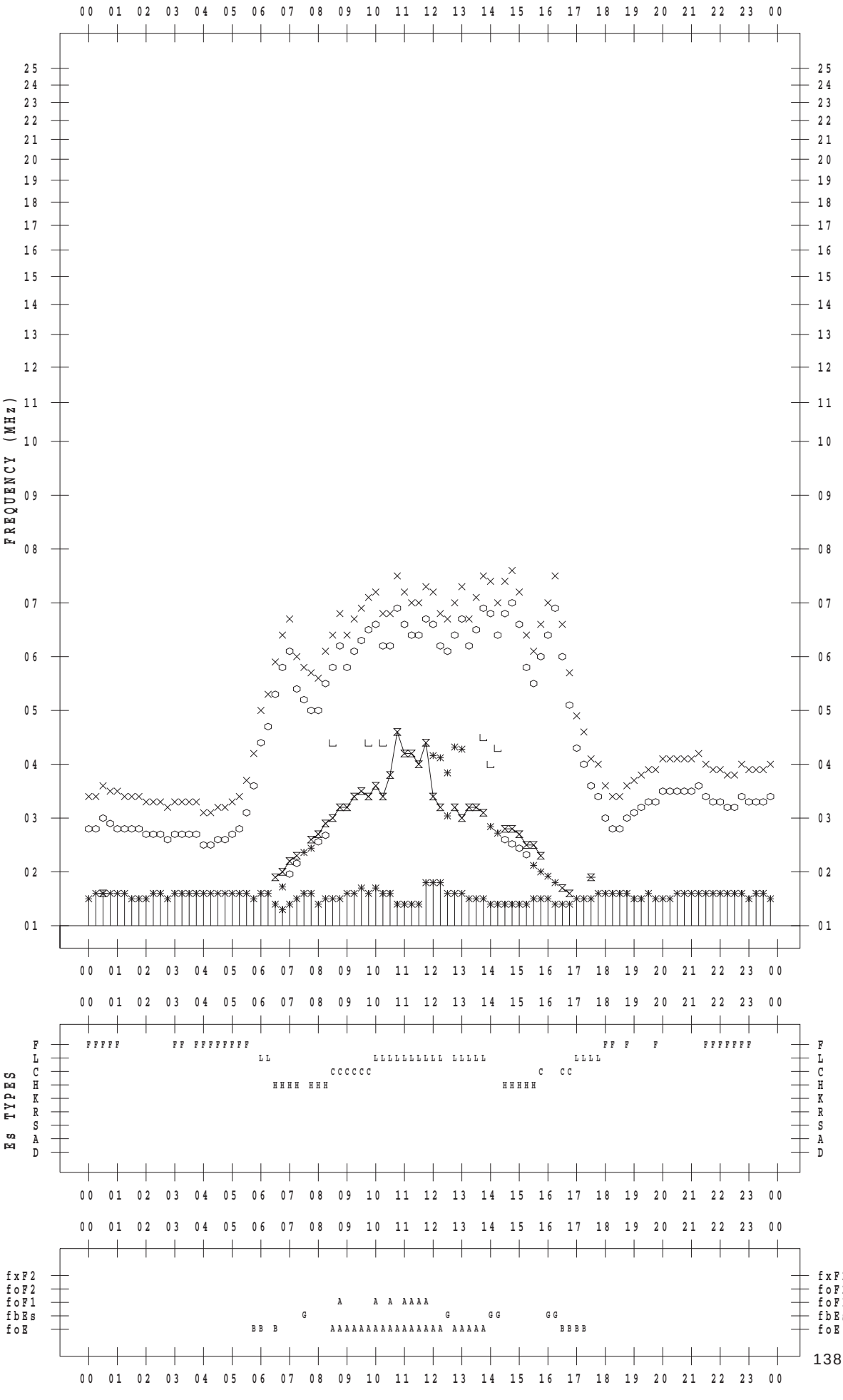
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018/11/ 1

135 °E MEAN TIME



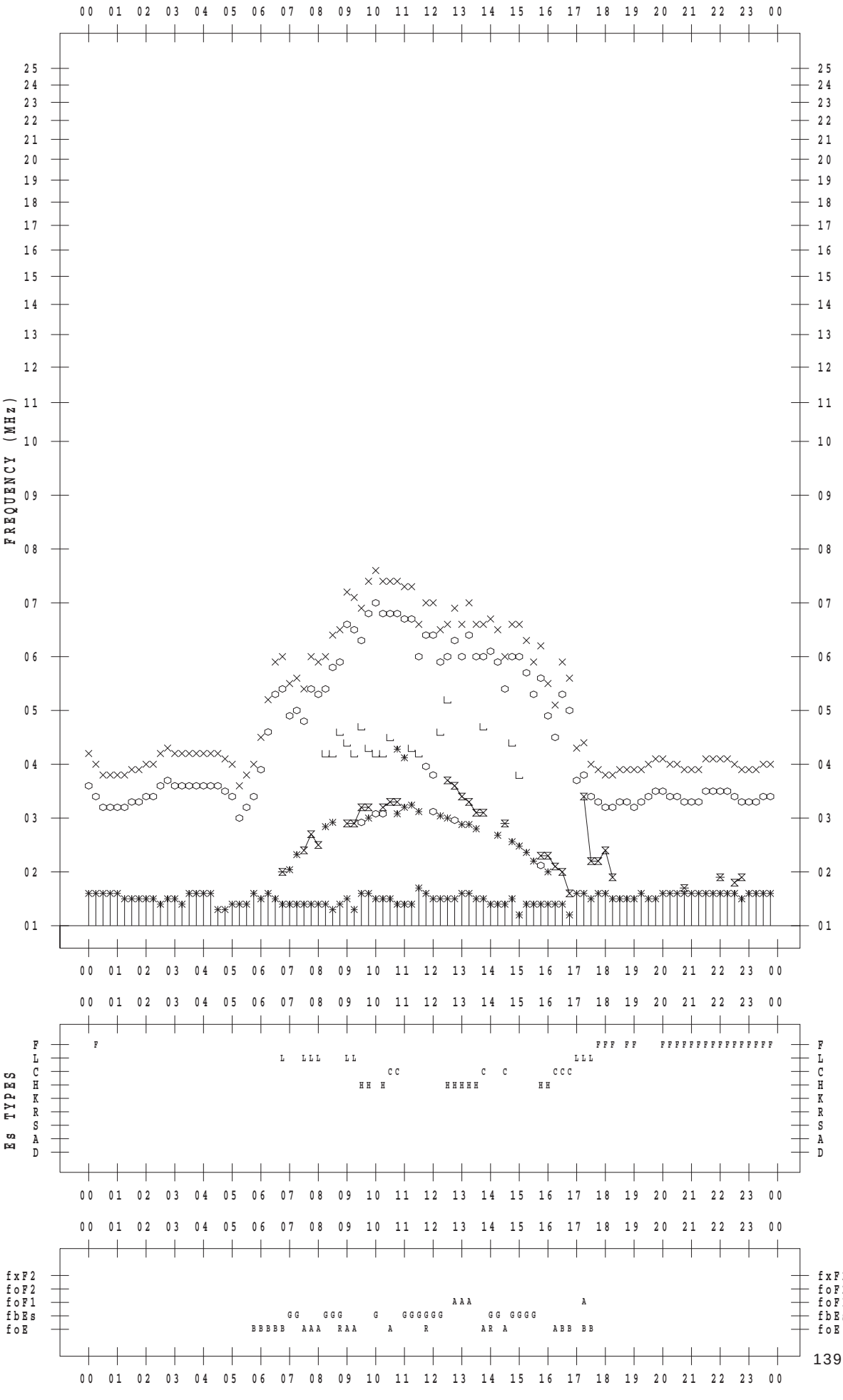
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018/11/ 2

135 °E MEAN TIME



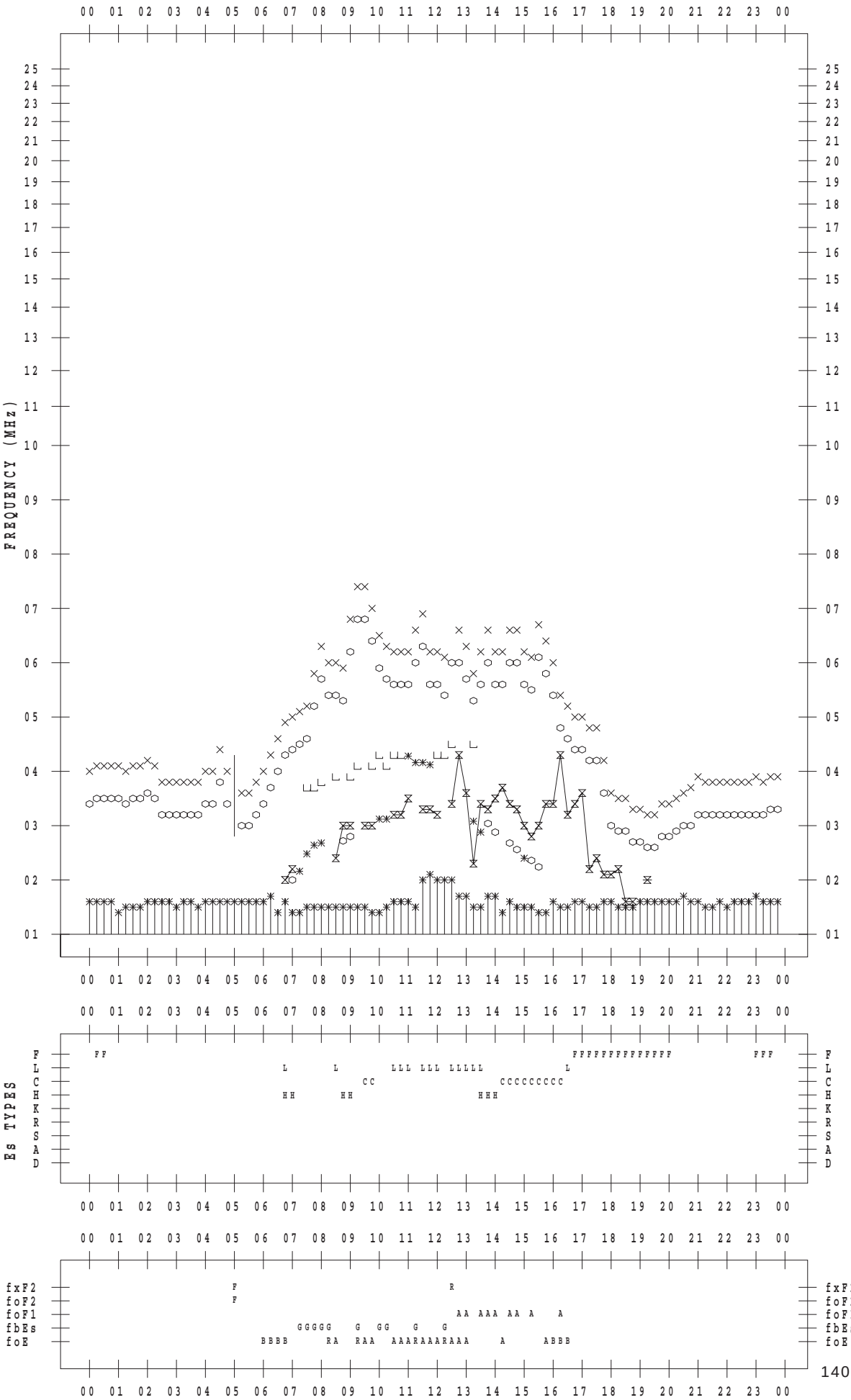
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018/11/ 3

135 °E MEAN TIME



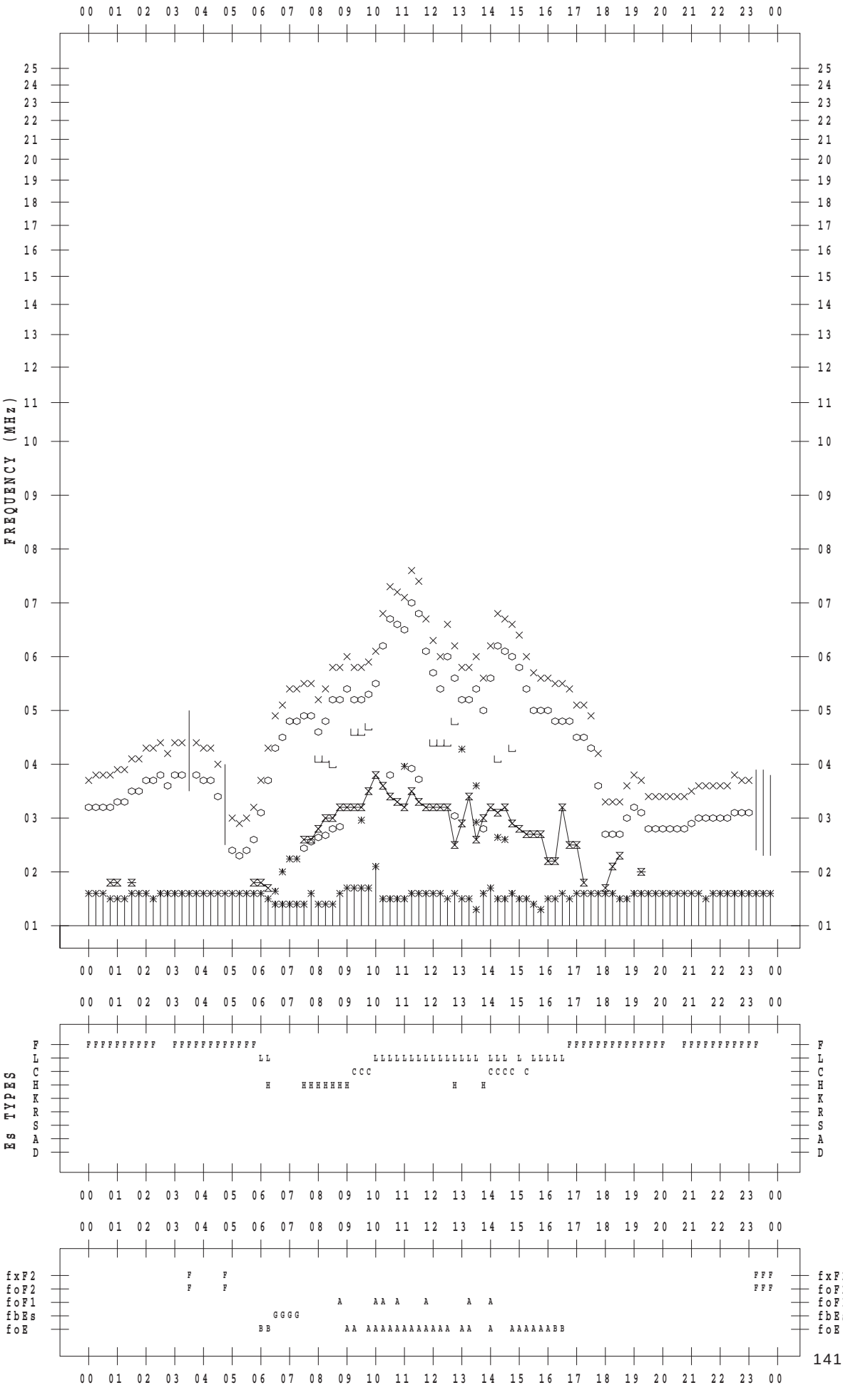
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018/11/ 4

135 °E MEAN TIME



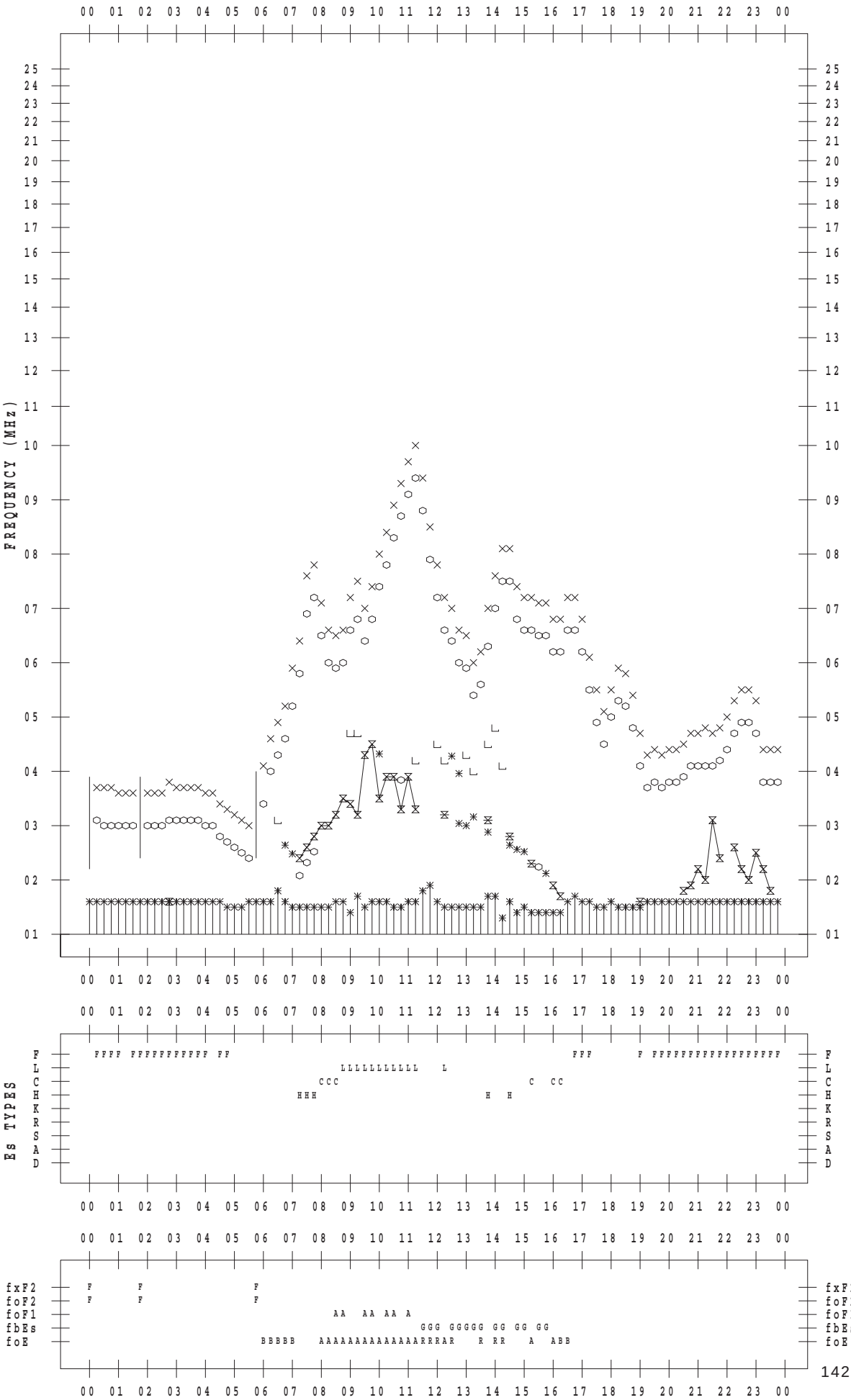
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018/11/ 5

135 °E MEAN TIME



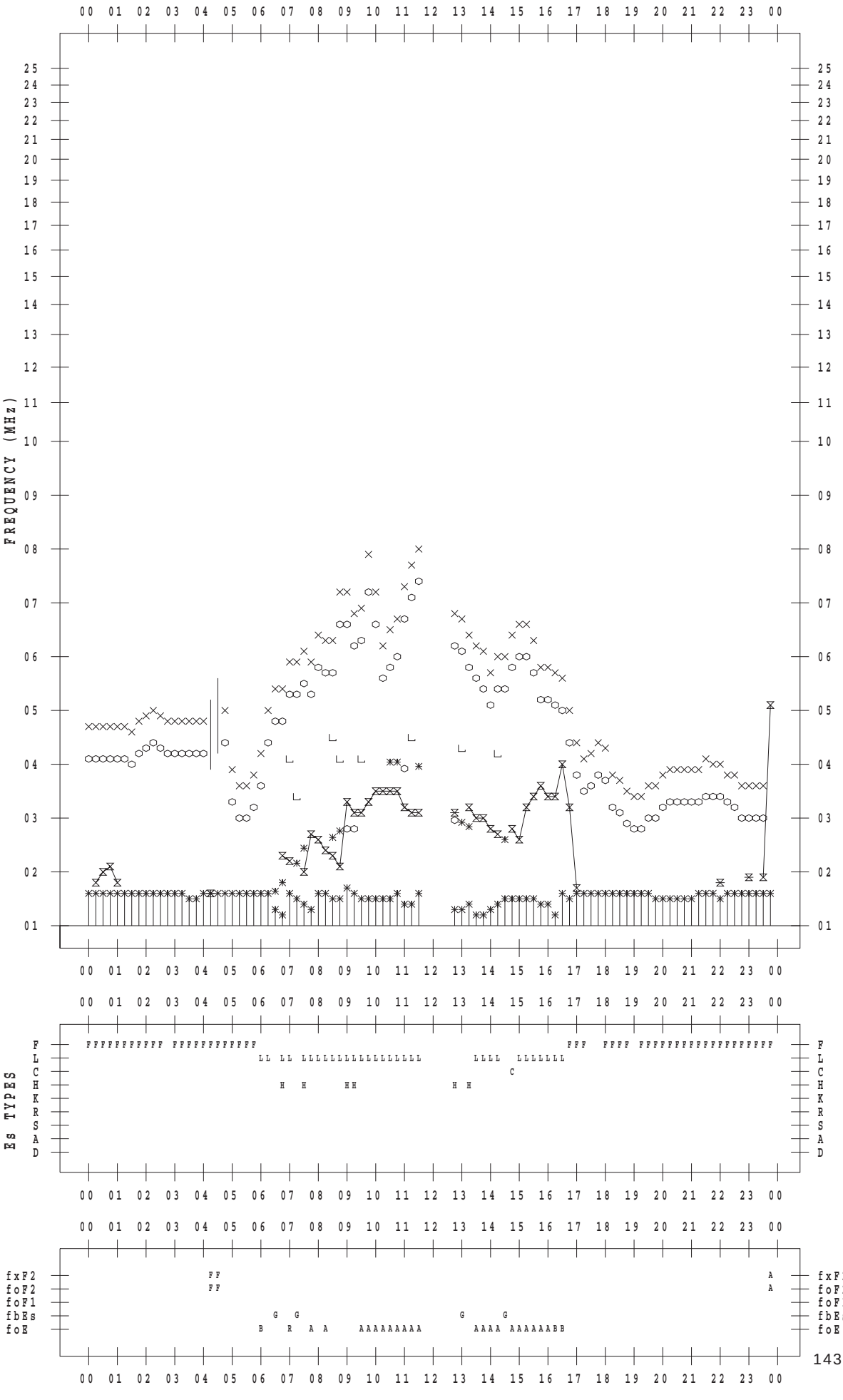
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018/11/ 6

135 °E MEAN TIME



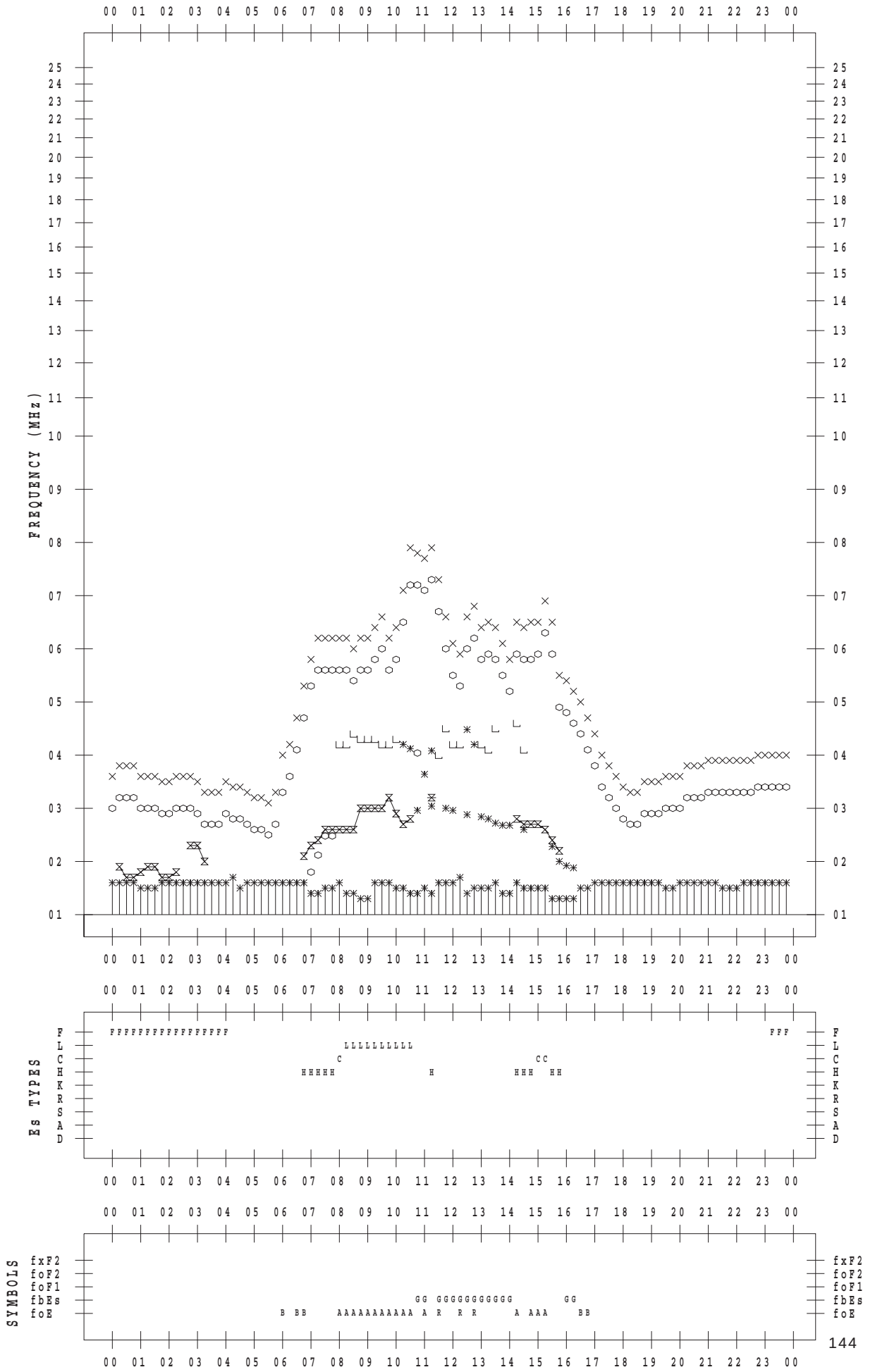
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018/11/ 7

135 °E MEAN TIME



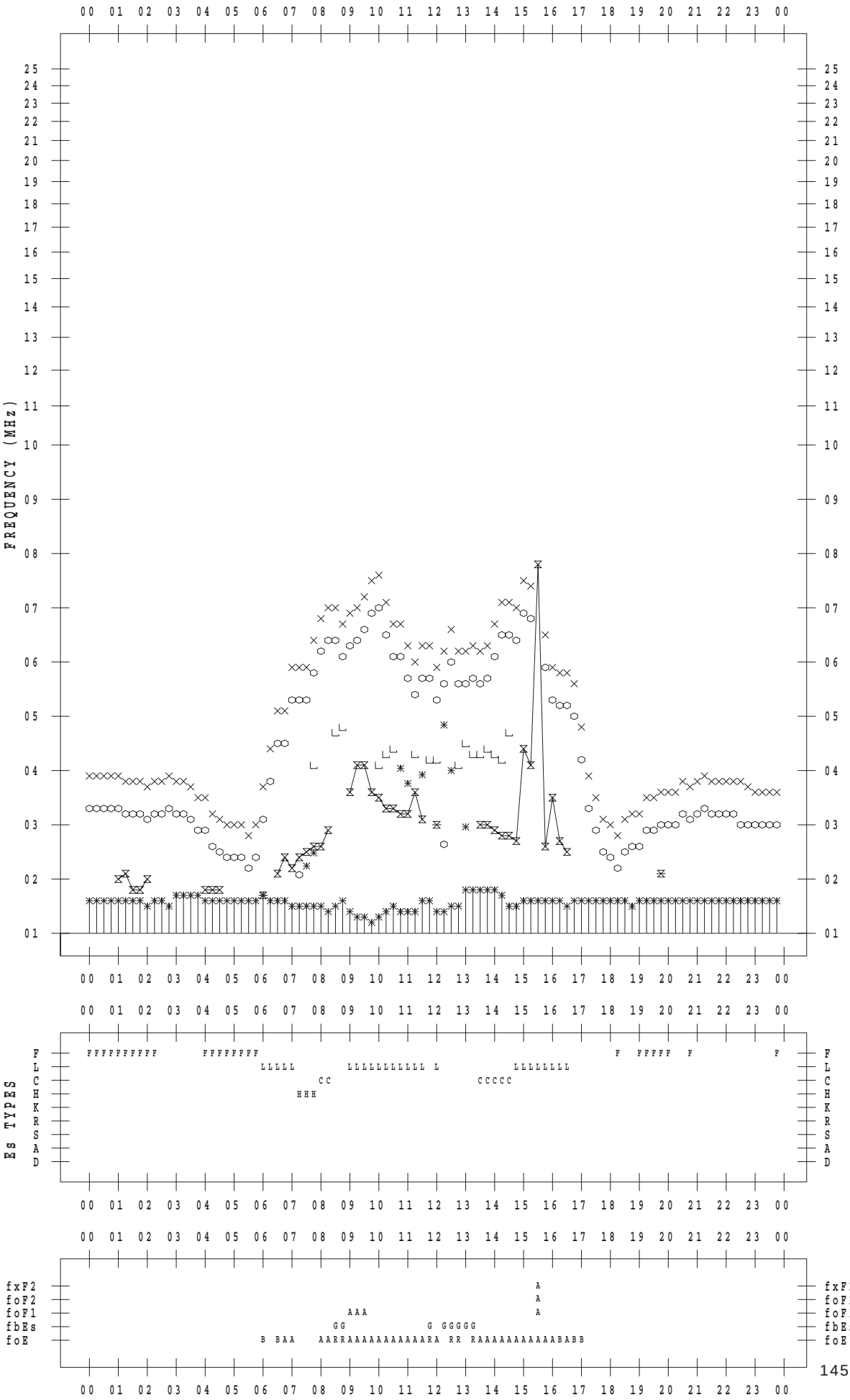
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018/11/ 8

135 °E MEAN TIME



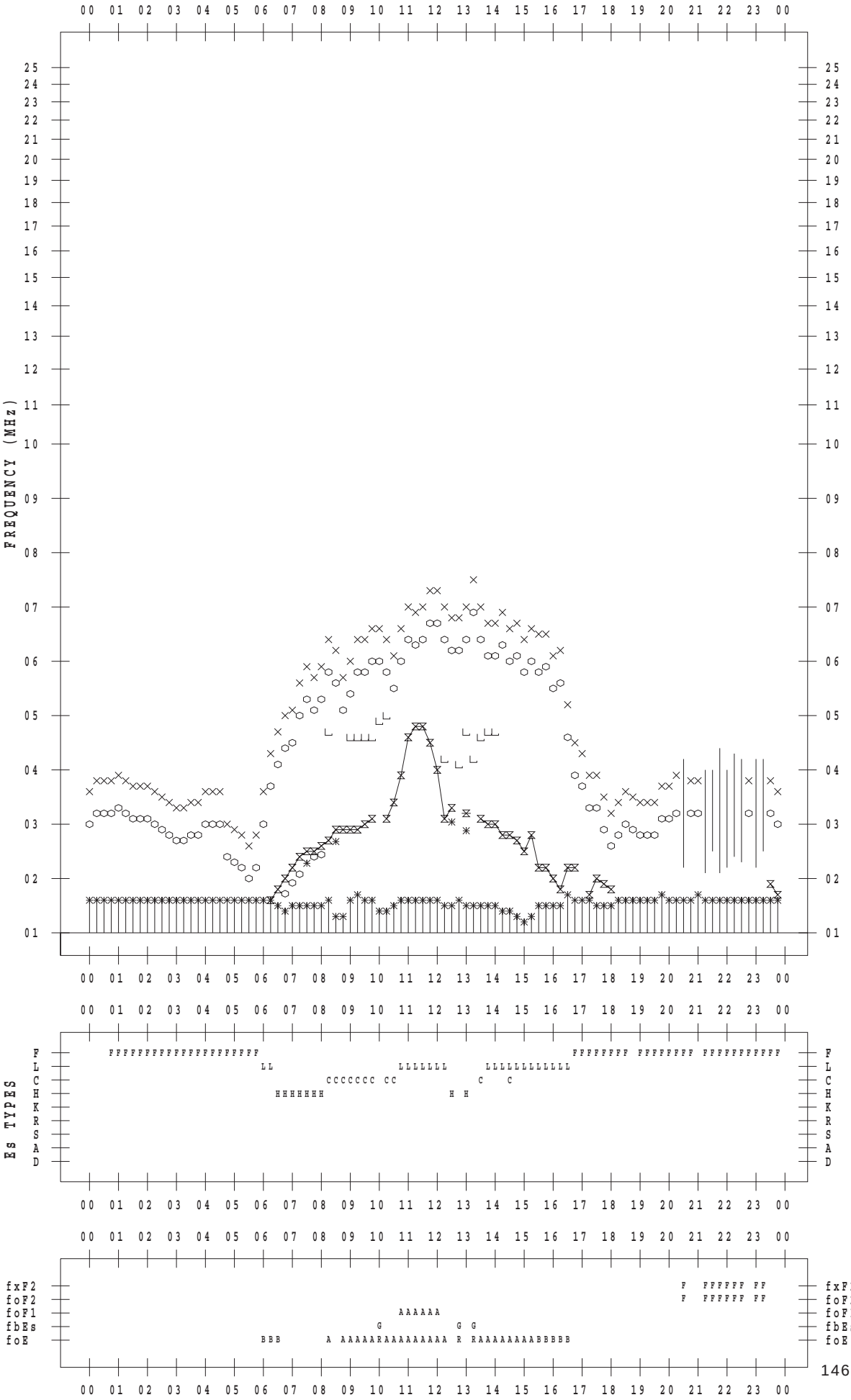
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018/11/ 9

135 °E MEAN TIME



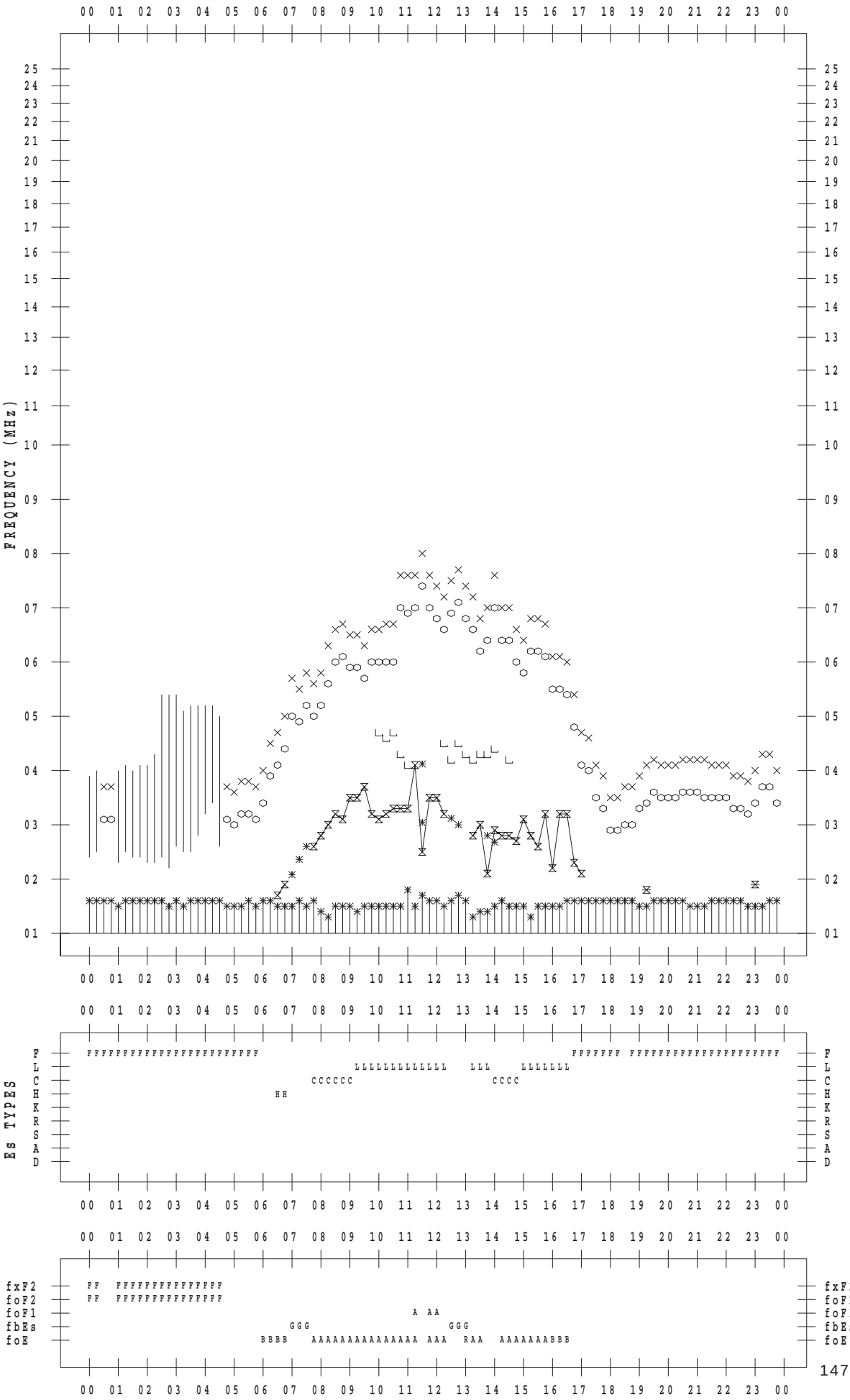
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018/11/10

135 °E MEAN TIME



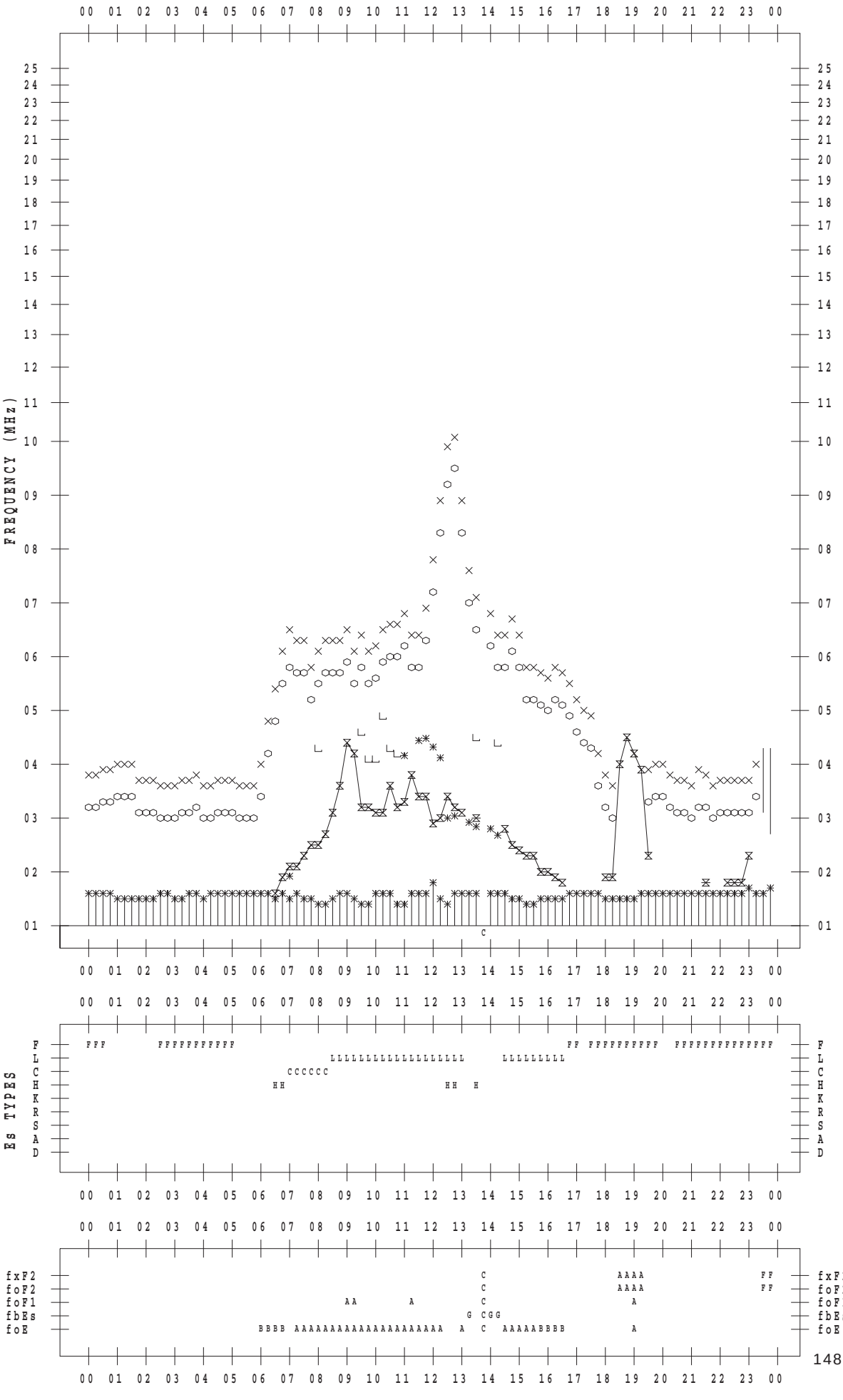
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018/11/11

135 °E MEAN TIME



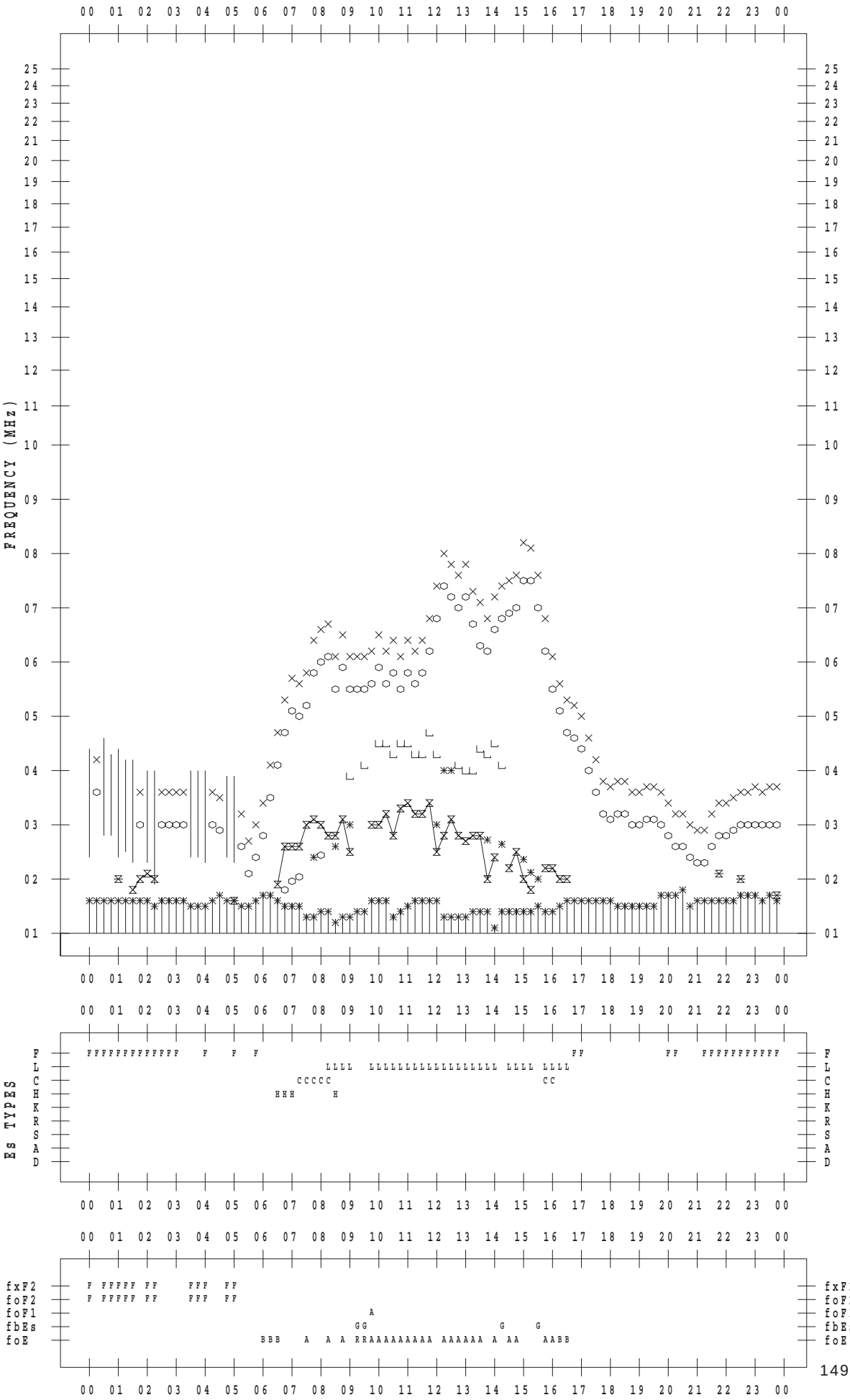
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018/11/12

135 °E MEAN TIME



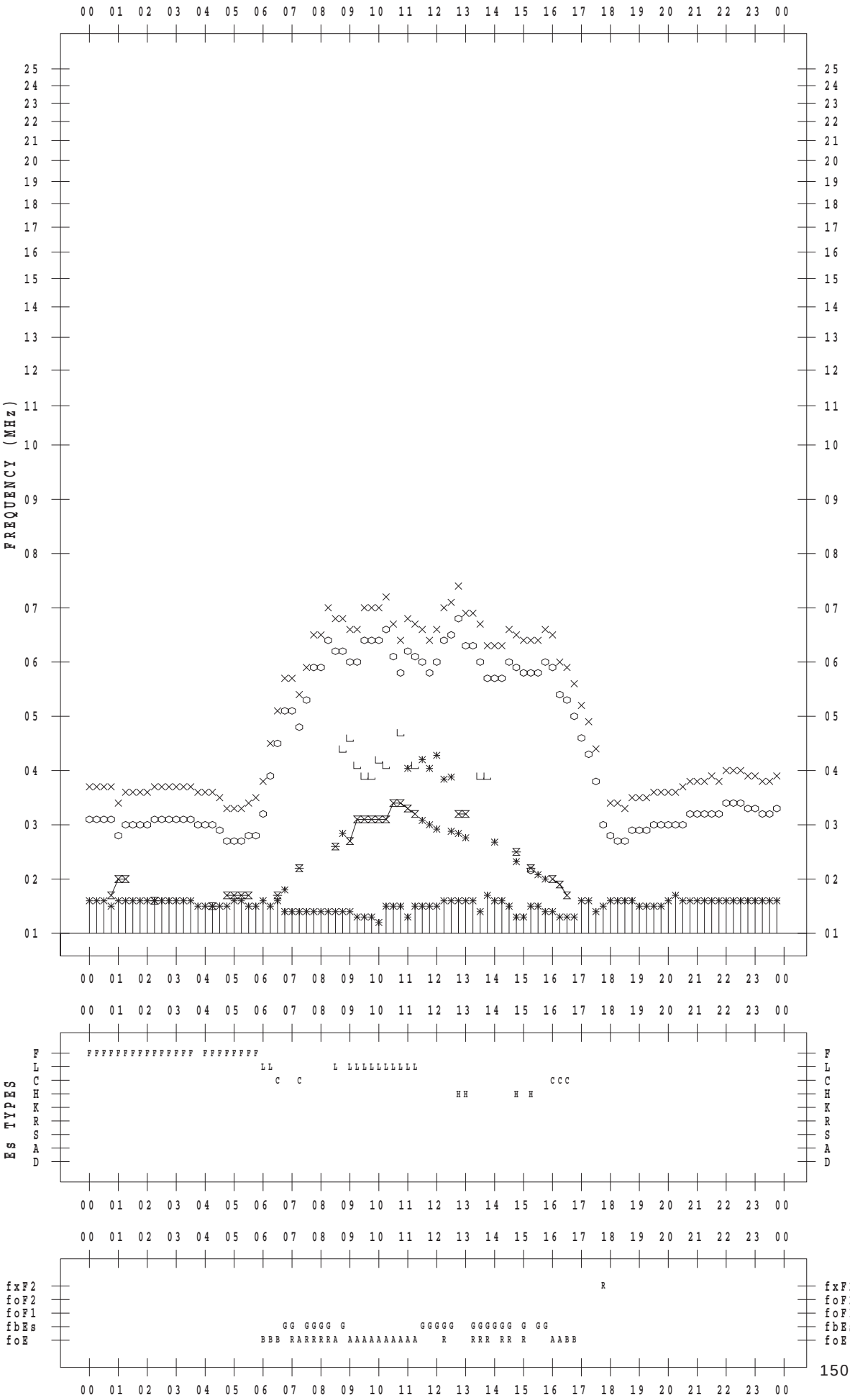
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018/11/13

135 °E MEAN TIME



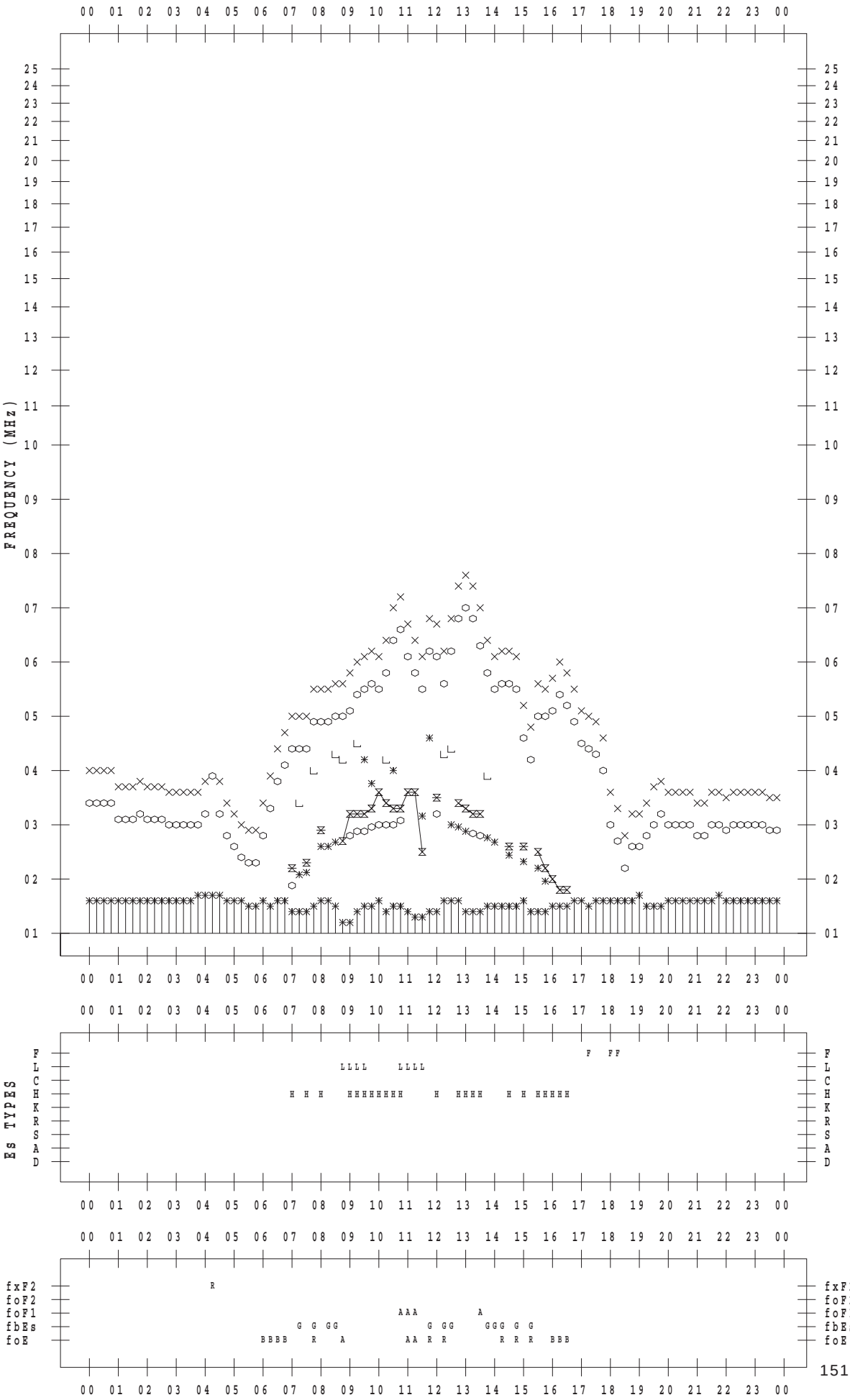
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018/11/14

135 °E MEAN TIME



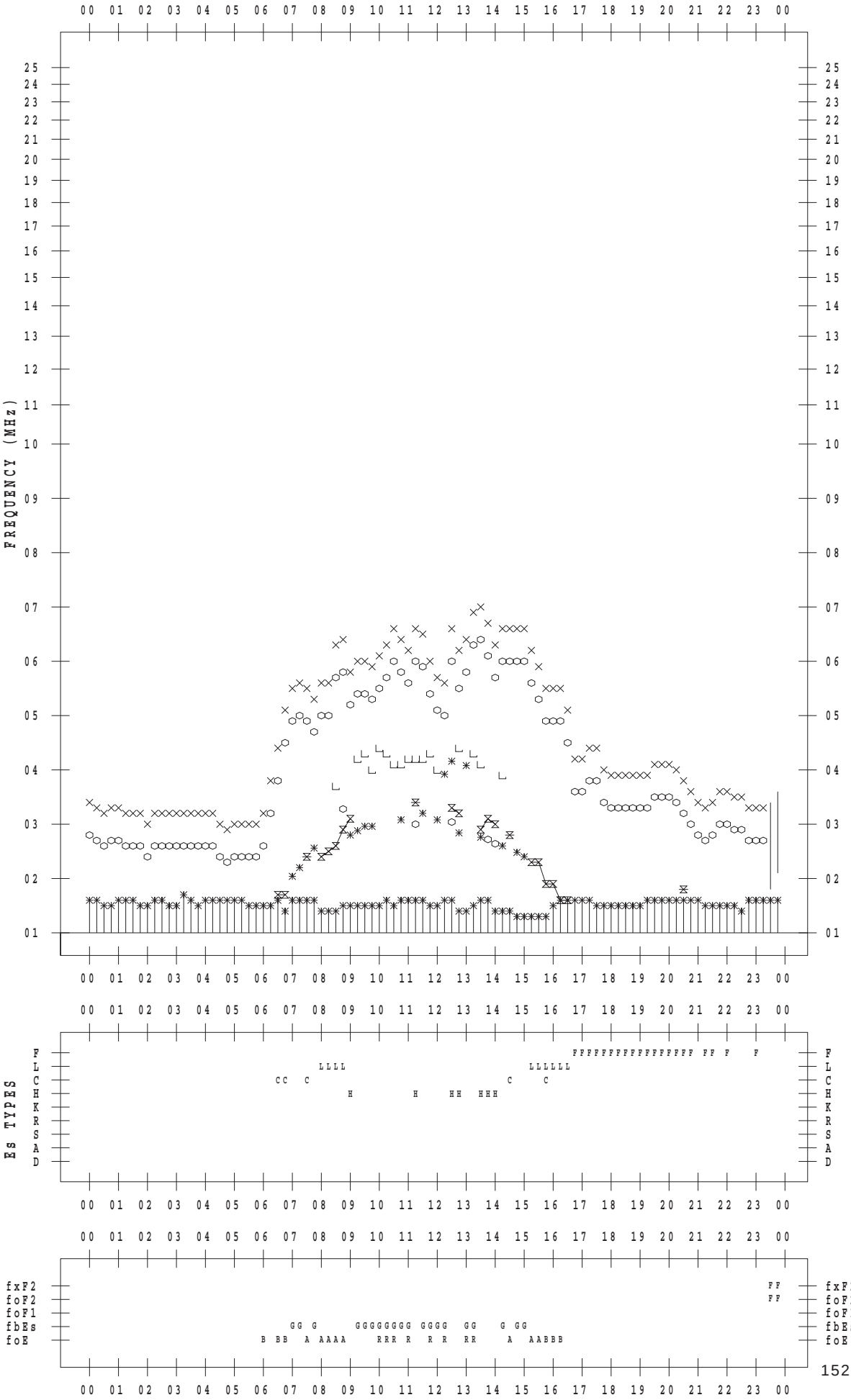
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018/11/15

135 °E MEAN TIME



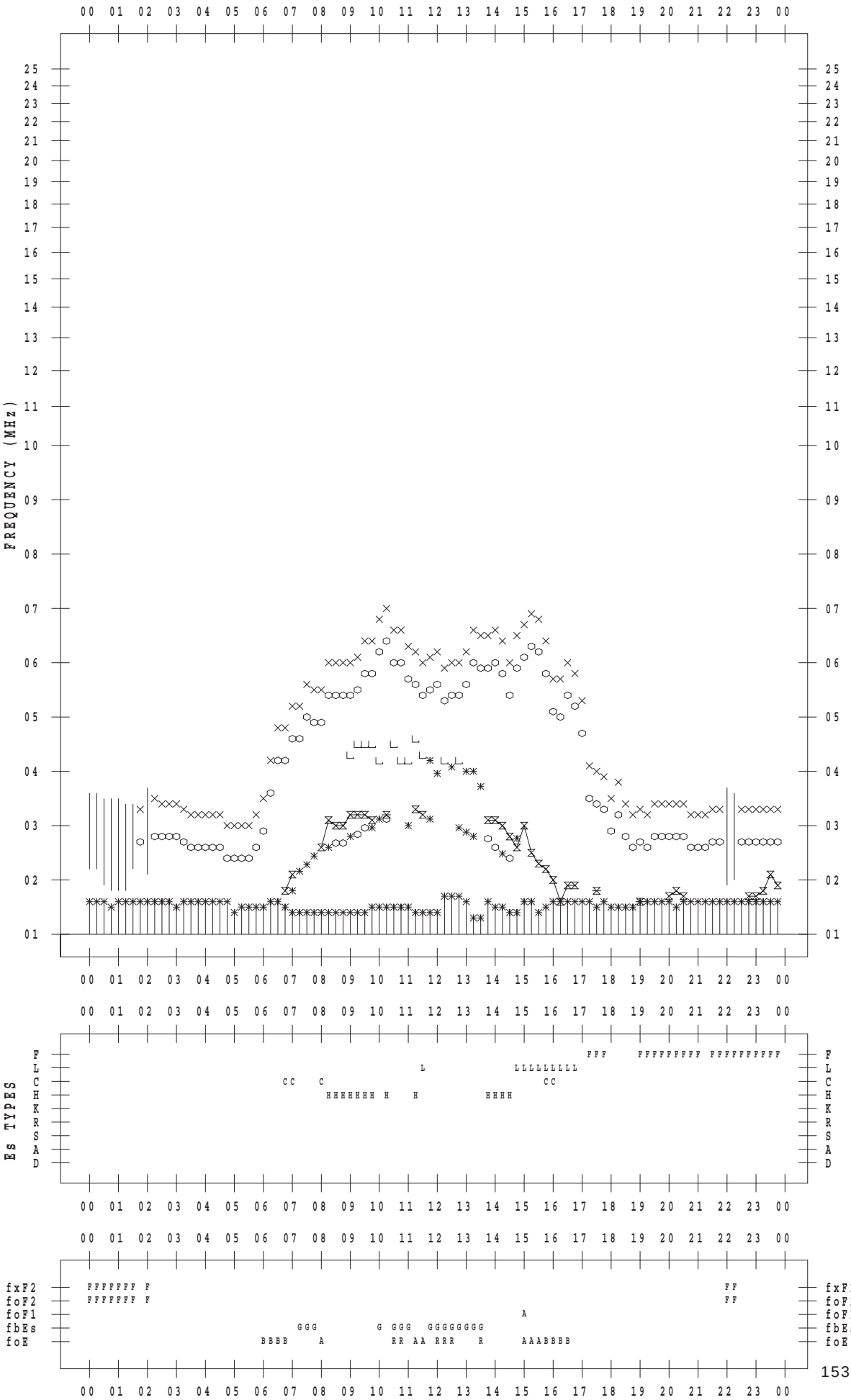
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018/11/16

135 °E MEAN TIME



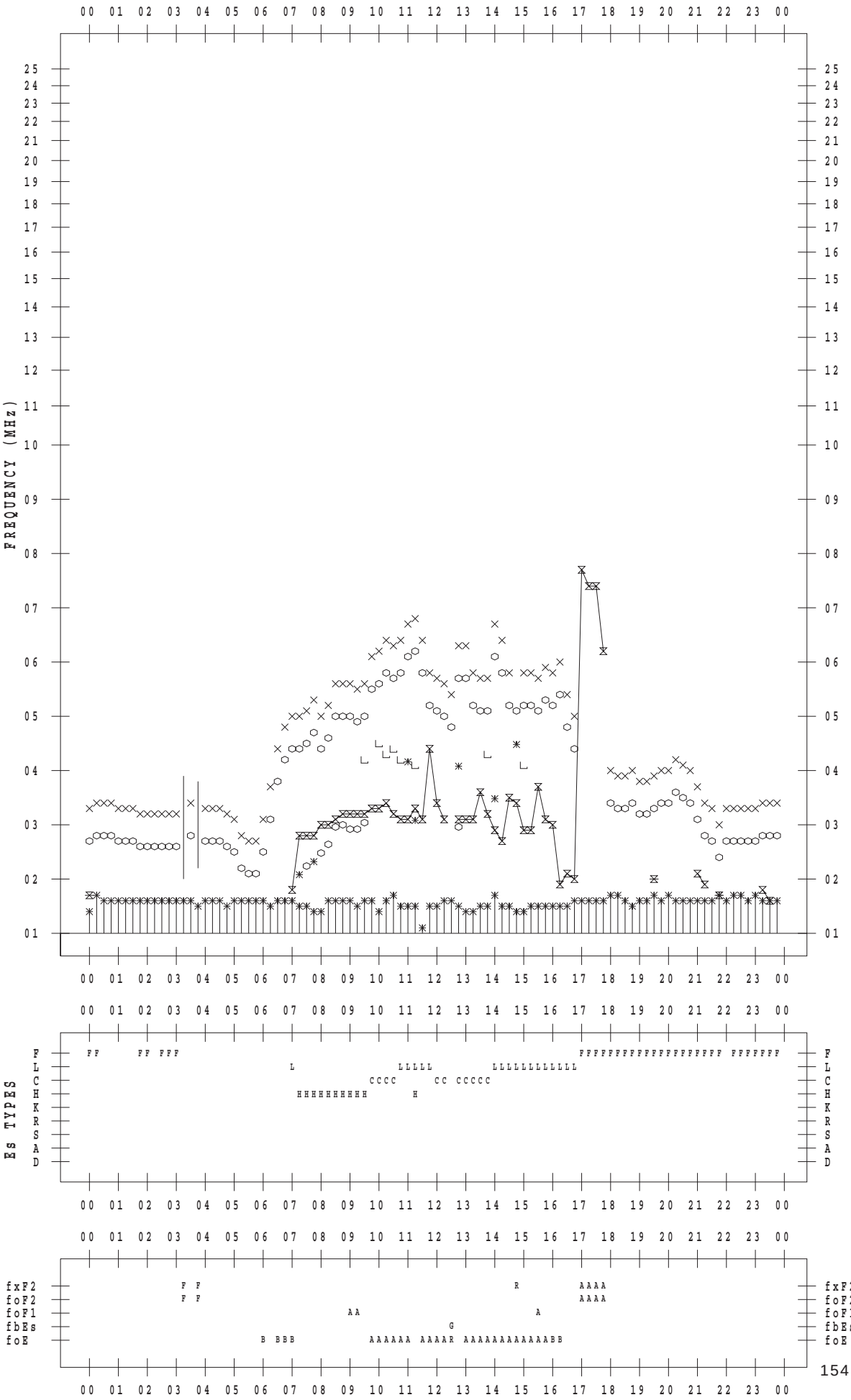
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018/11/17

135 °E MEAN TIME



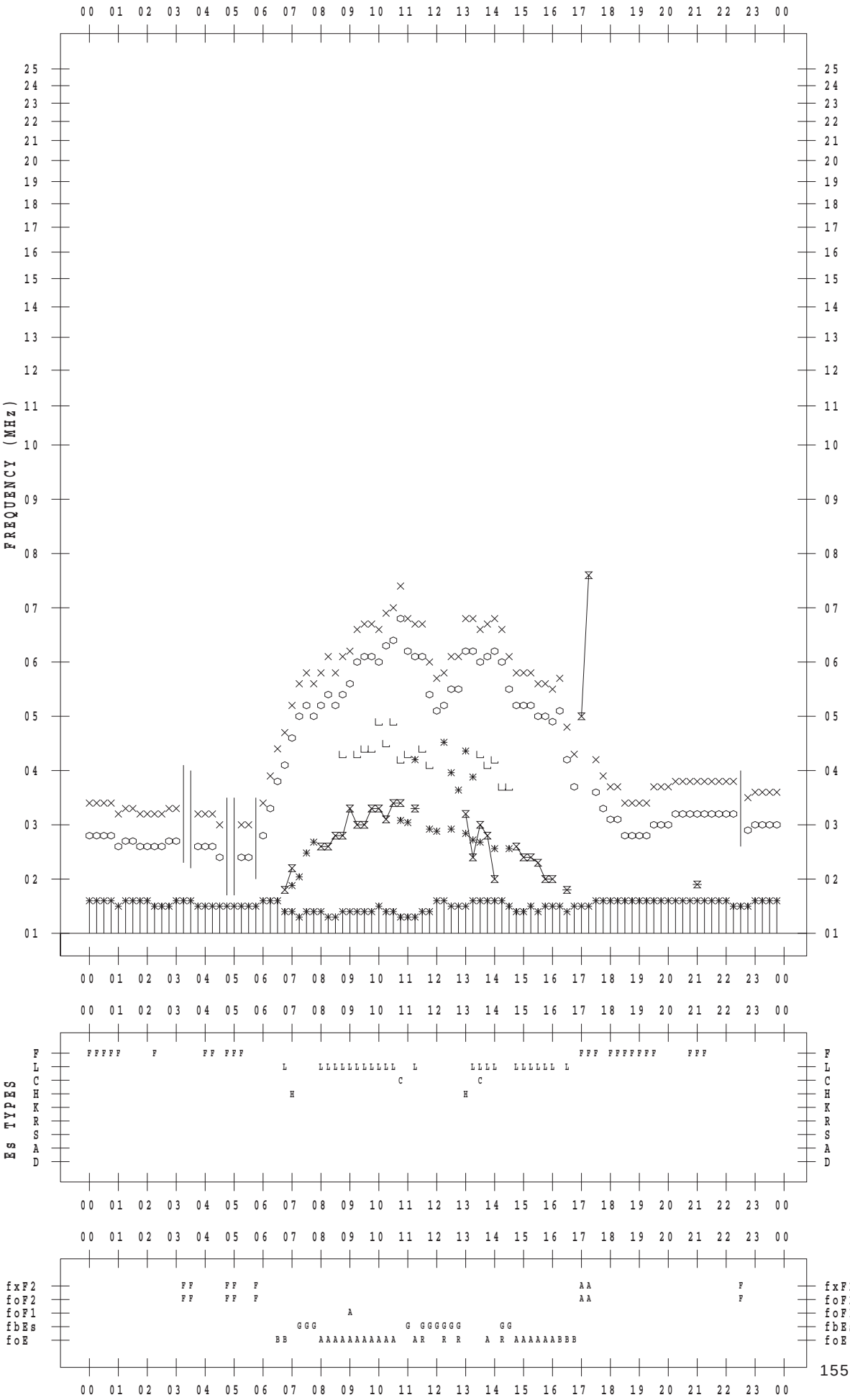
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018/11/18

135 °E MEAN TIME



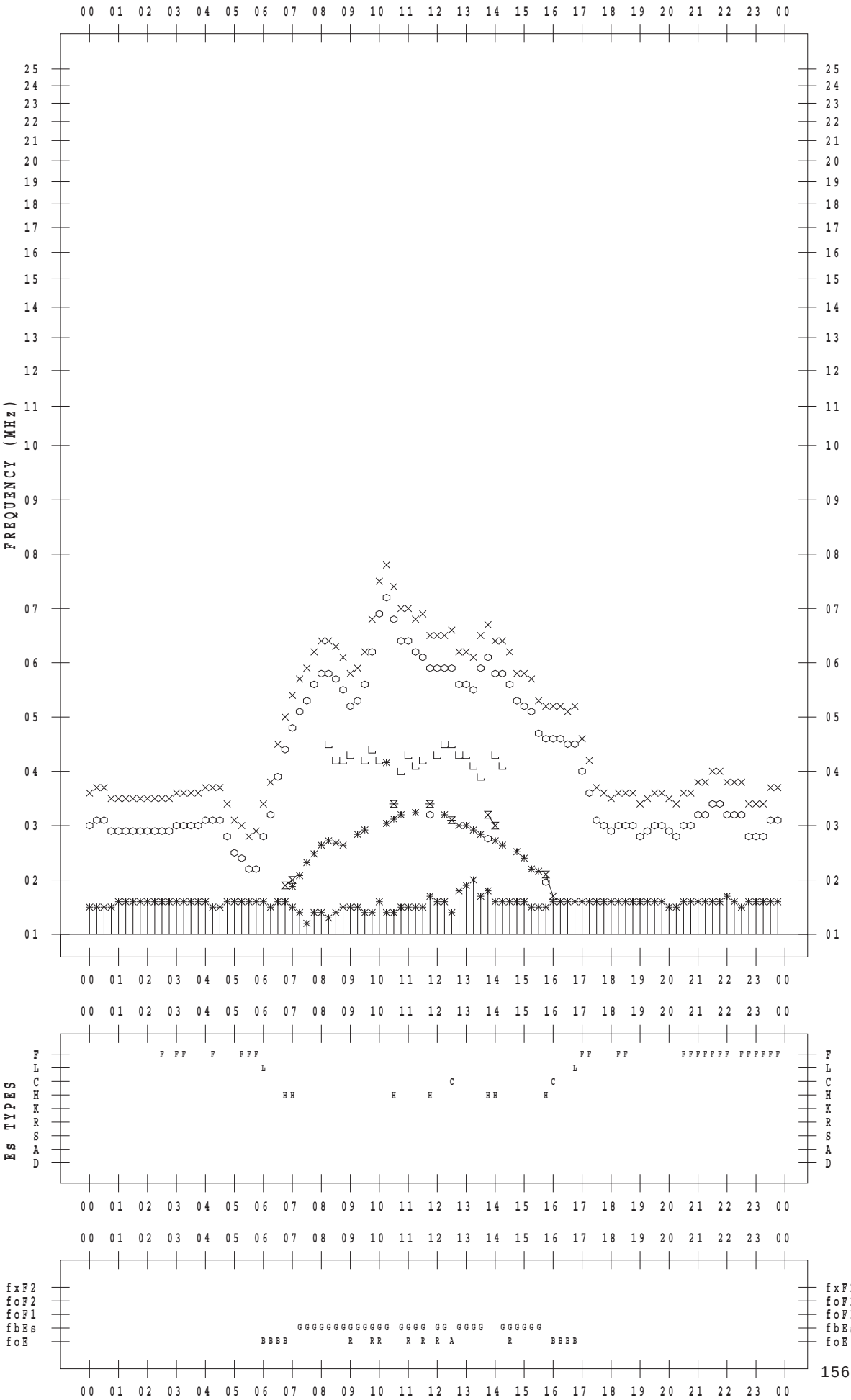
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018/11/19

135 °E MEAN TIME



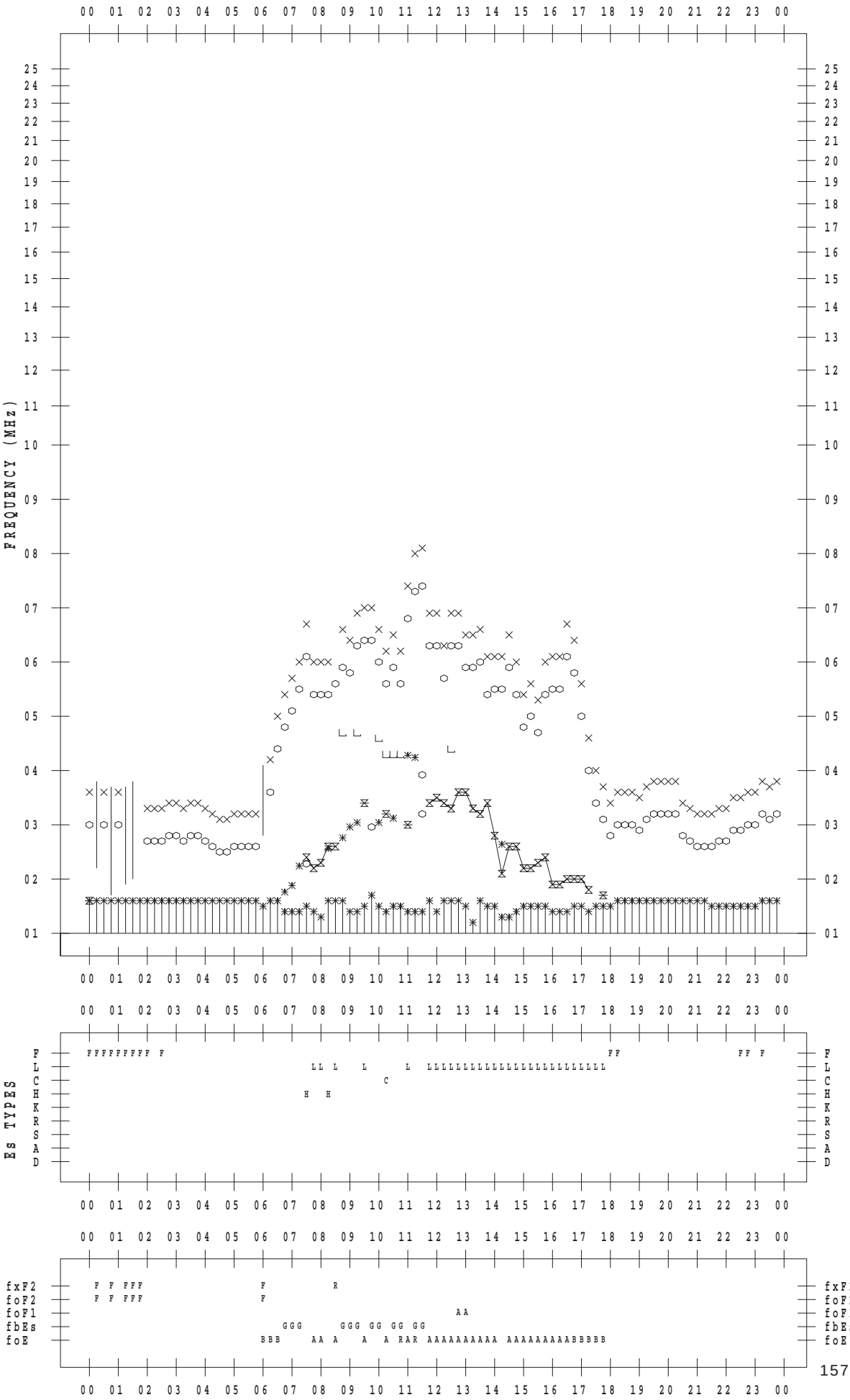
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018/11/20

135 °E MEAN TIME



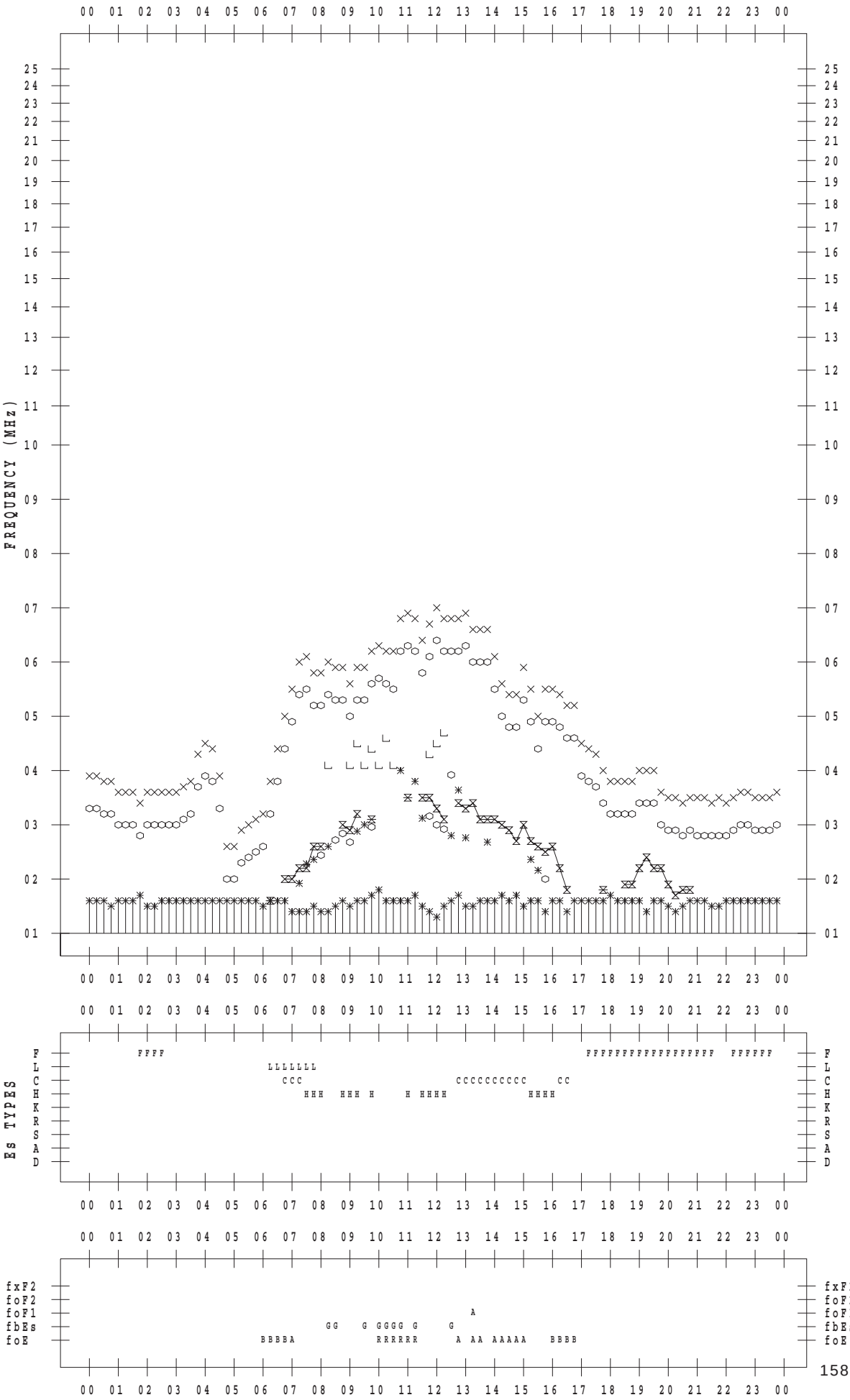
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018/11/21

135 °E MEAN TIME



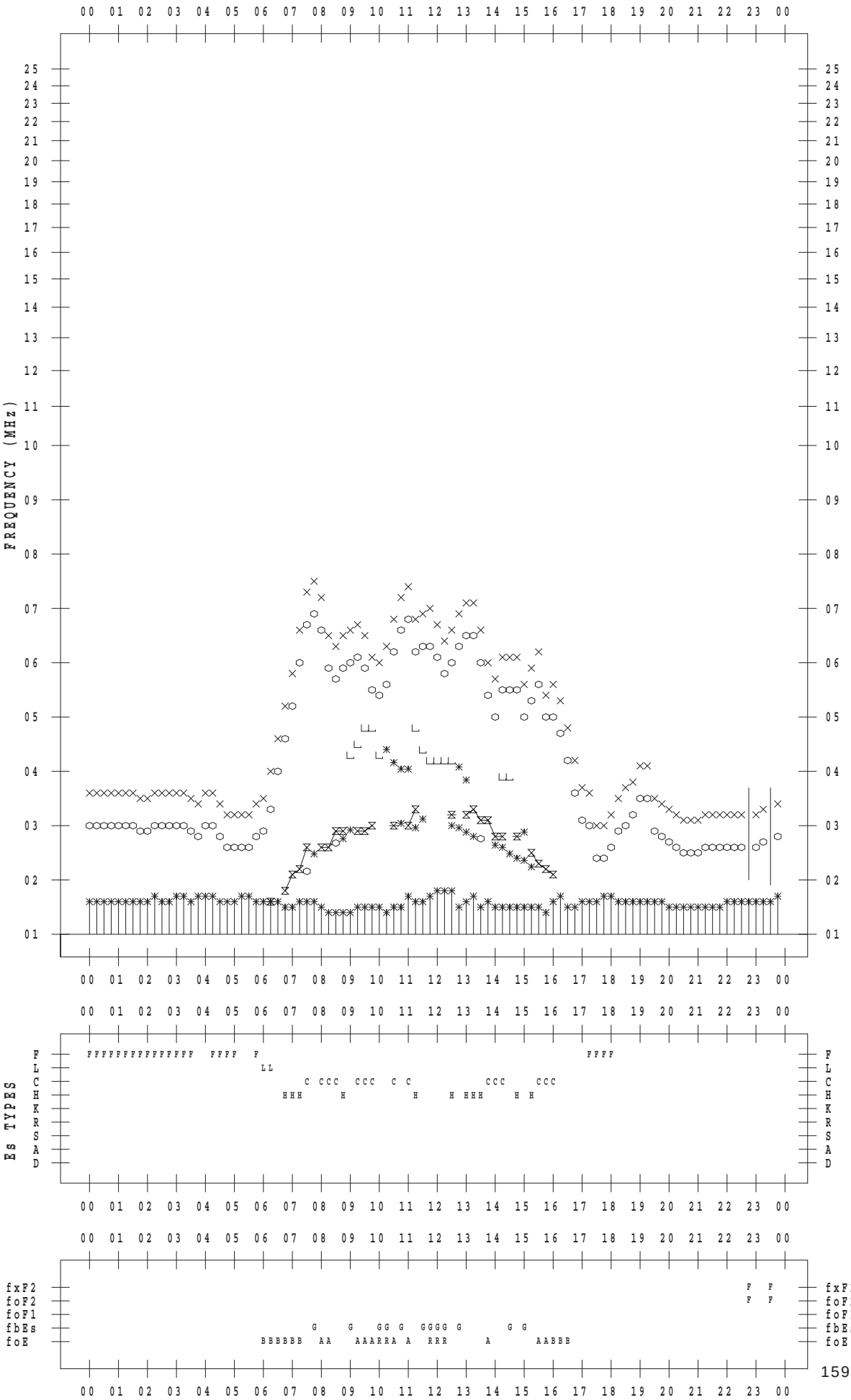
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018/11/22

135 °E MEAN TIME



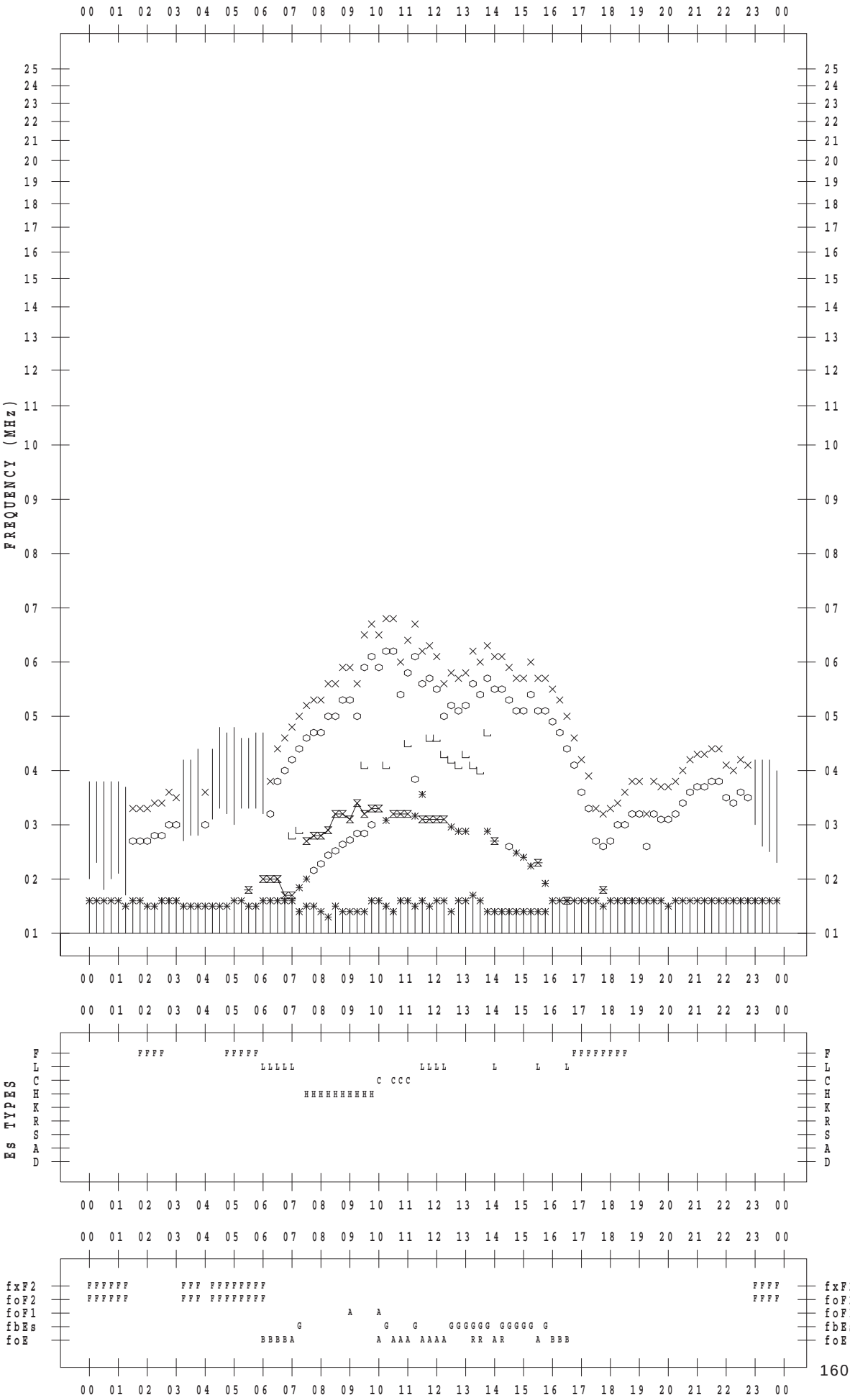
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018/11/23

135 °E MEAN TIME



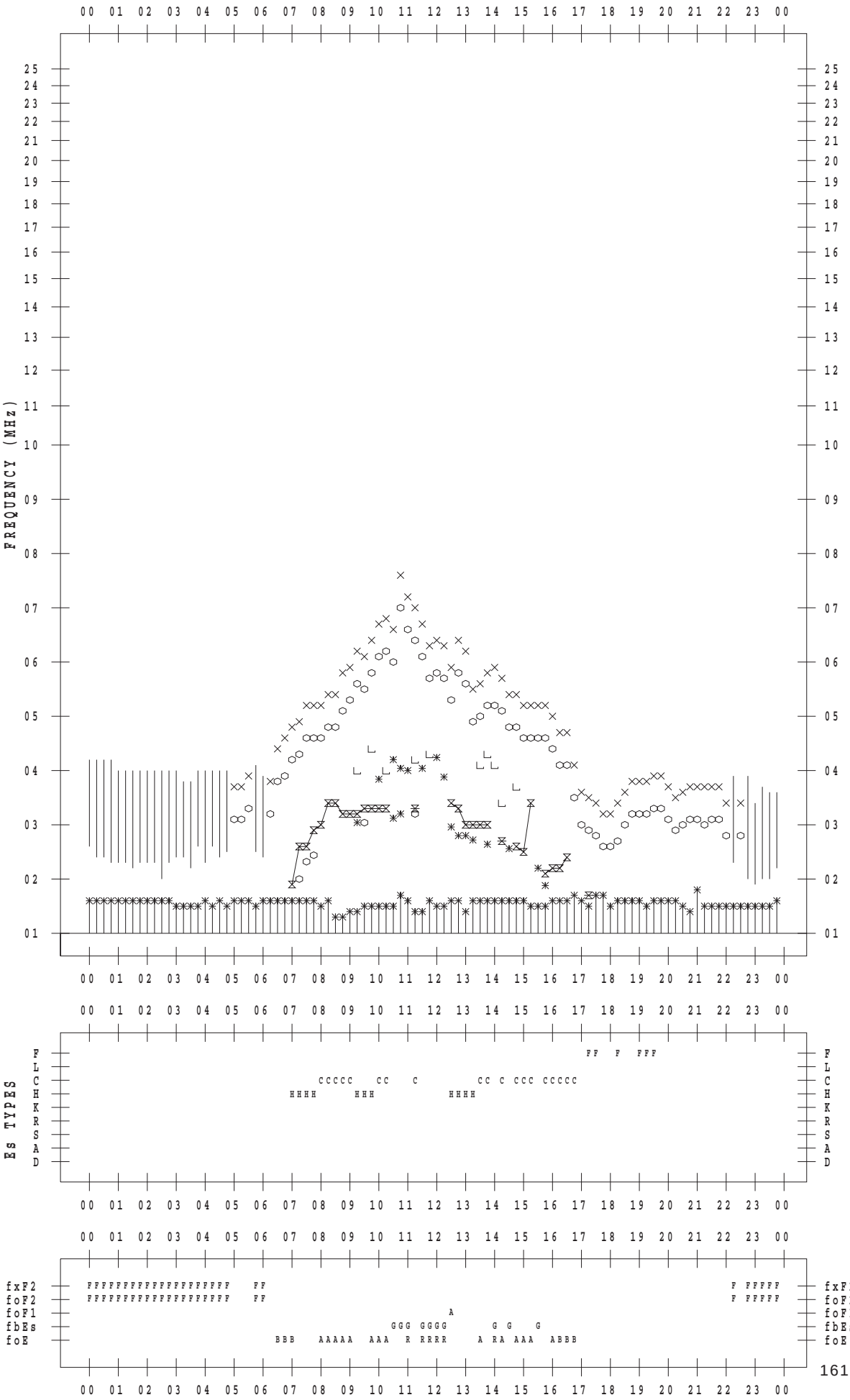
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018/11/24

135 °E MEAN TIME



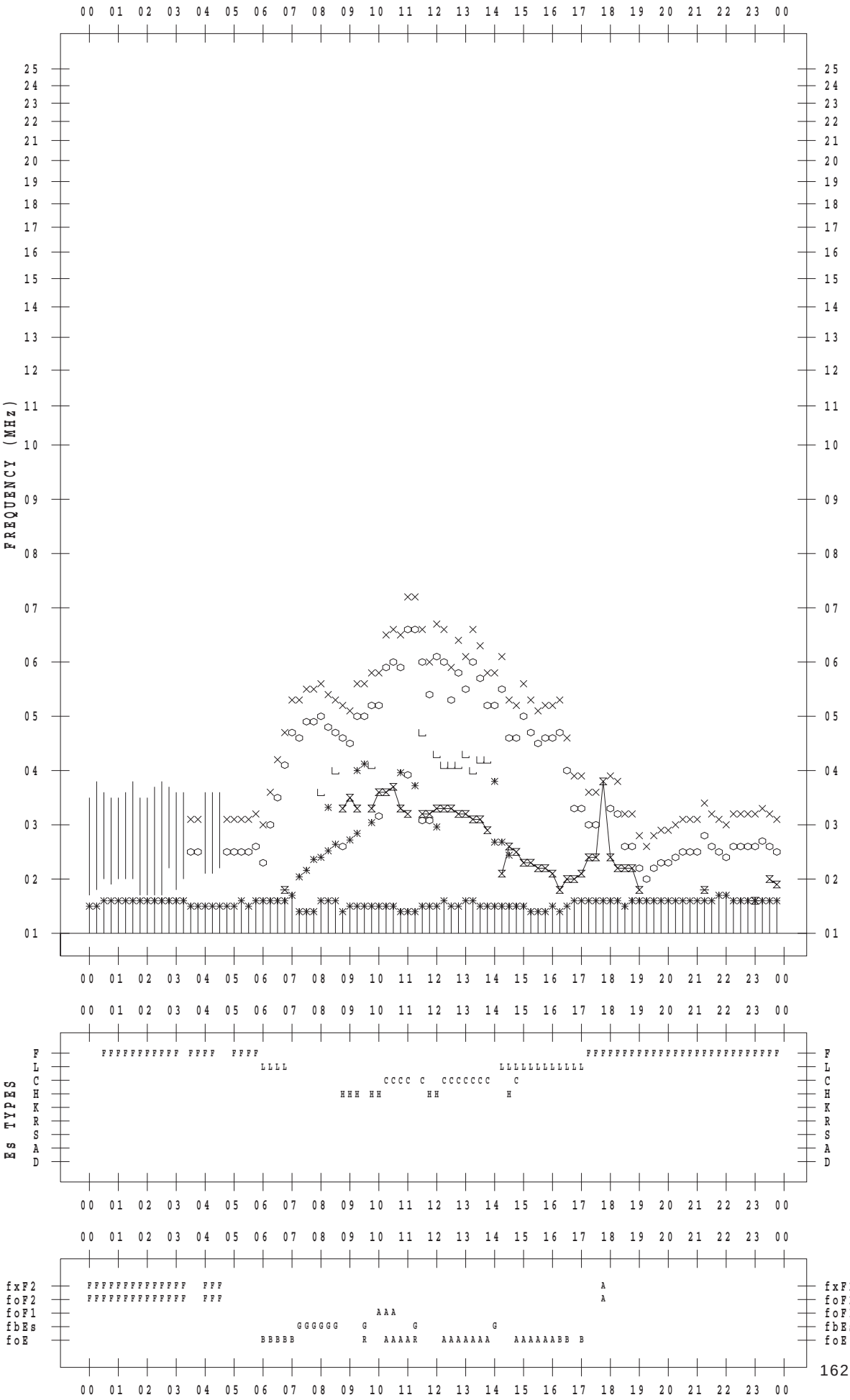
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018/11/25

135 °E MEAN TIME



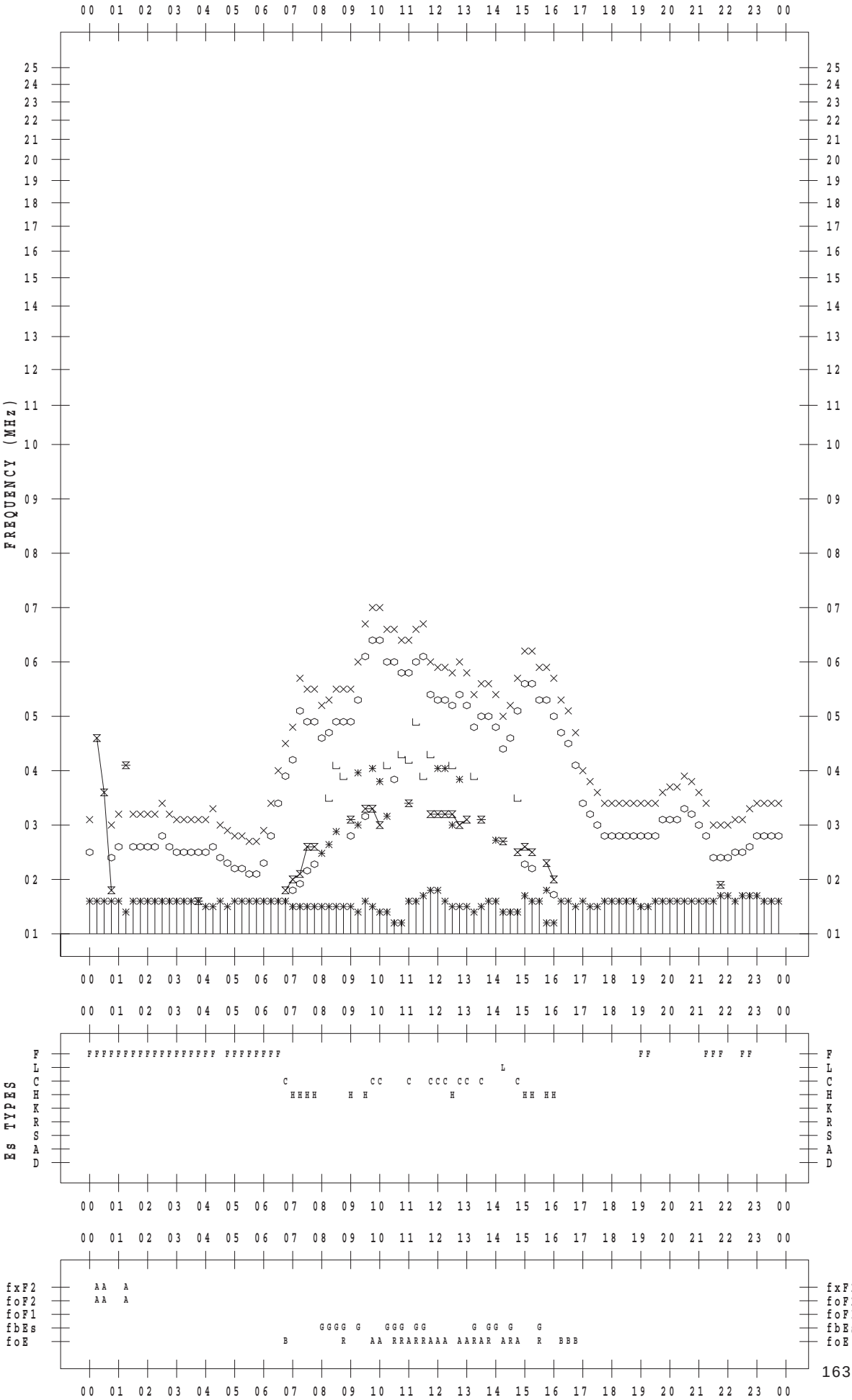
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018/11/26

135 °E MEAN TIME



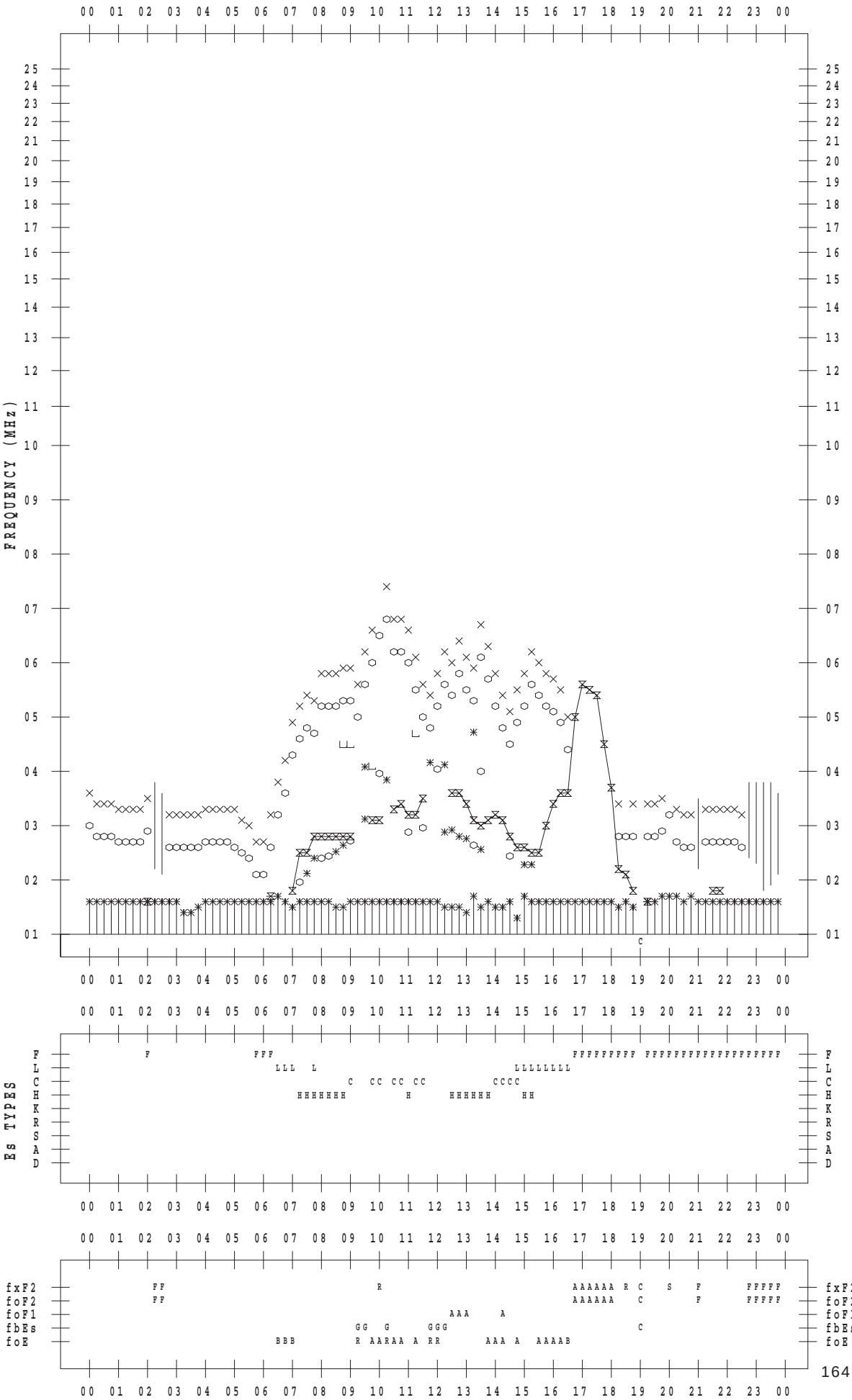
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018/11/27

135 °E MEAN TIME



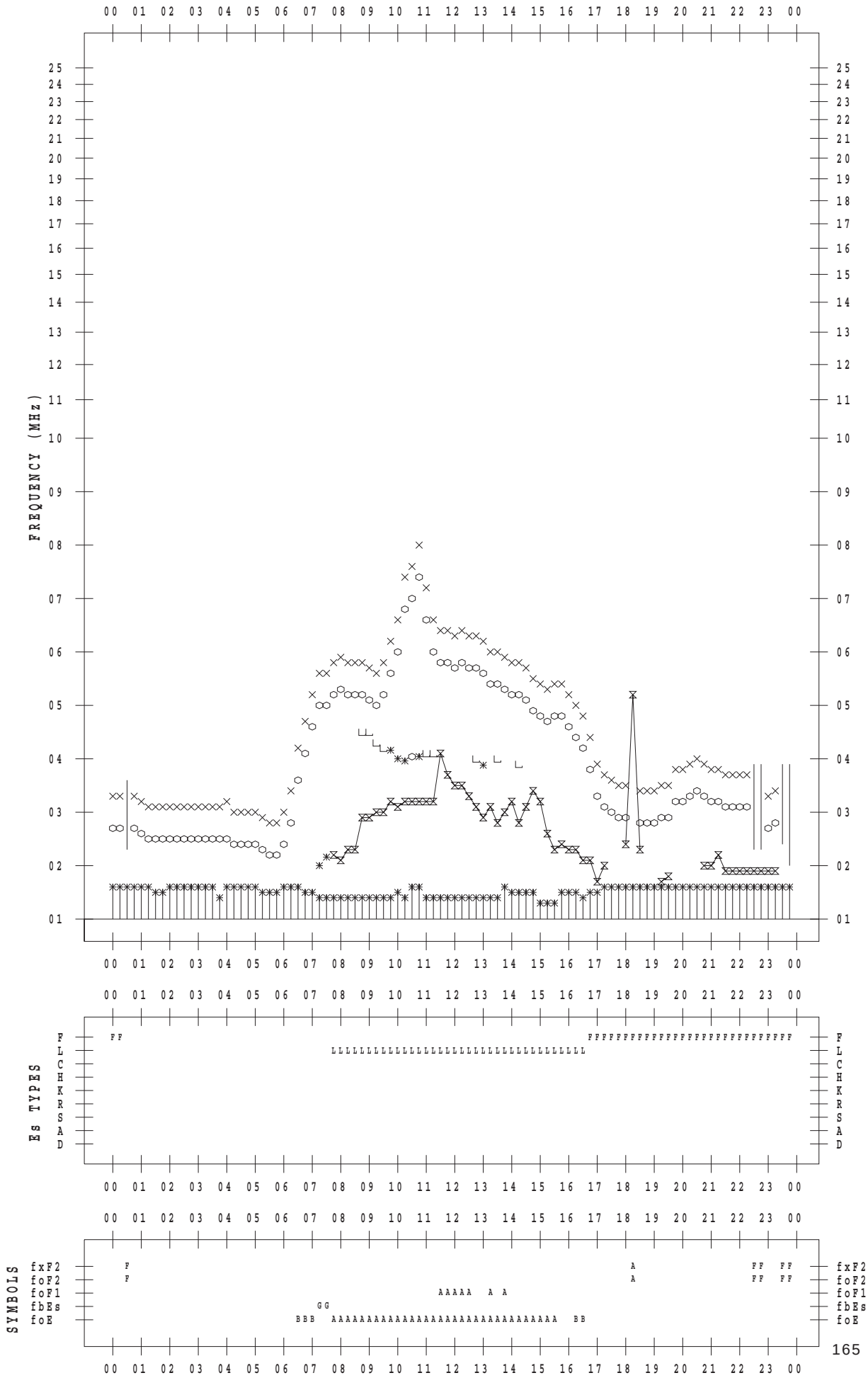
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018/11/28

135 °E MEAN TIME



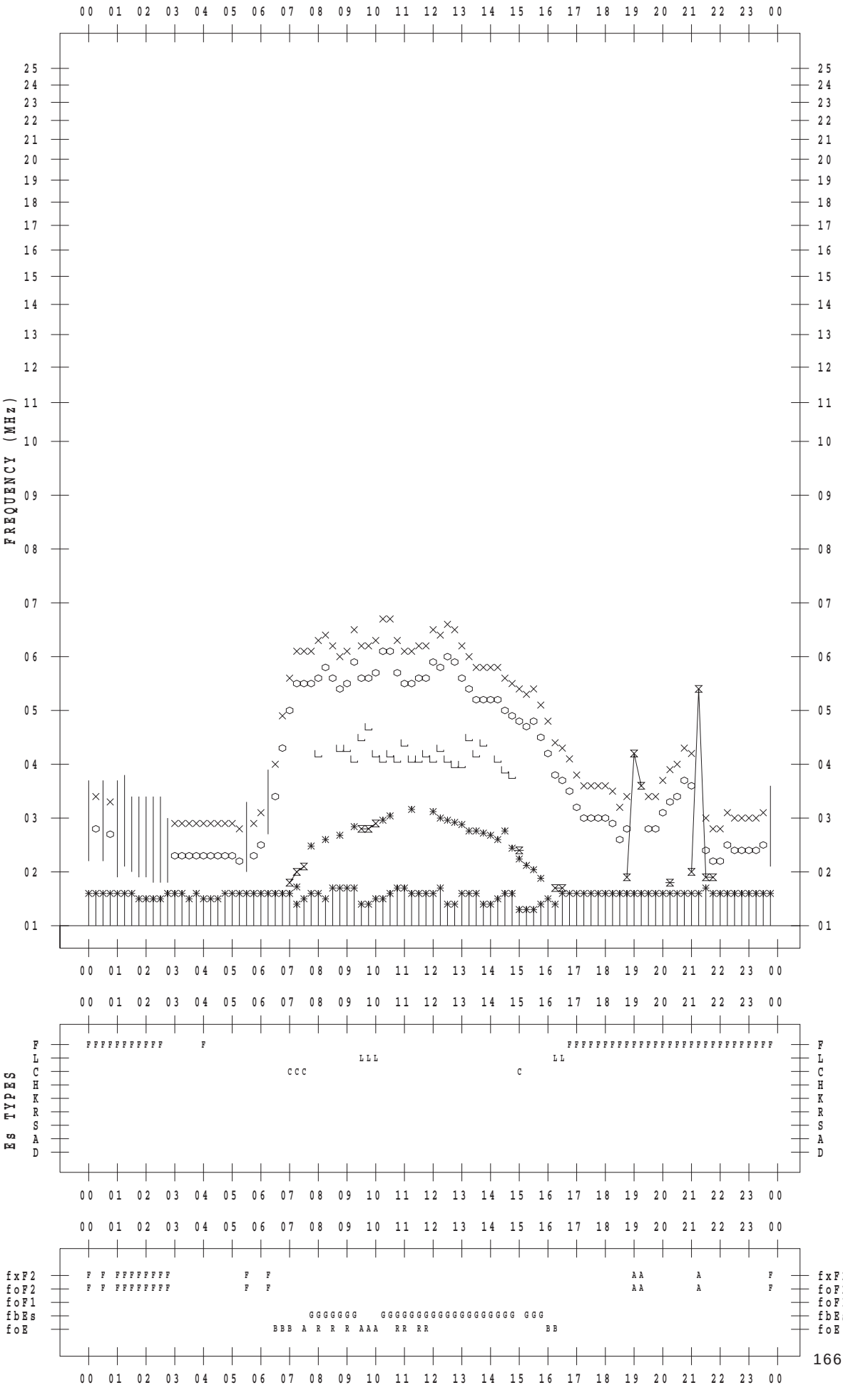
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018/11/29

135 °E MEAN TIME



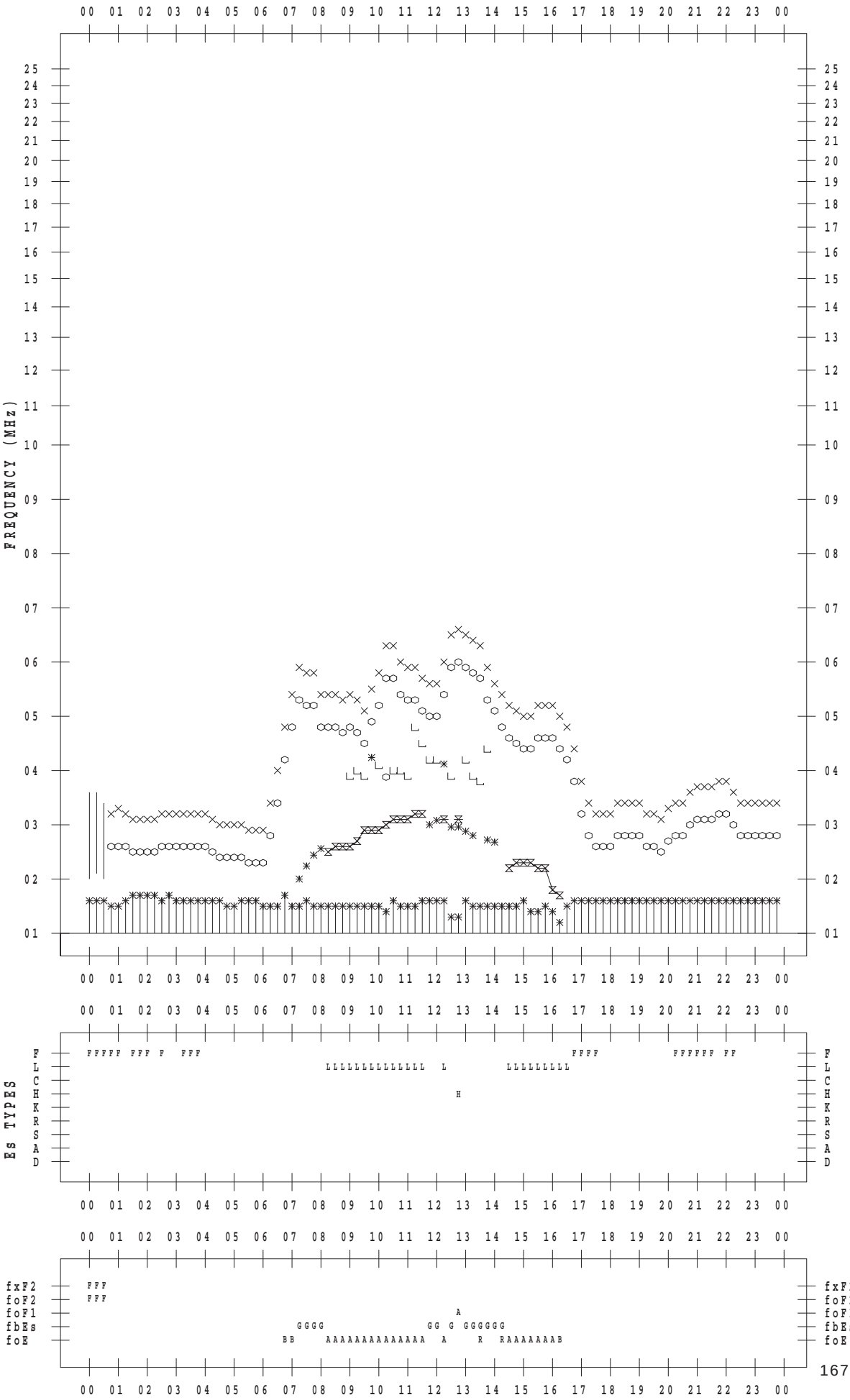
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2018/11/30

135 °E MEAN TIME



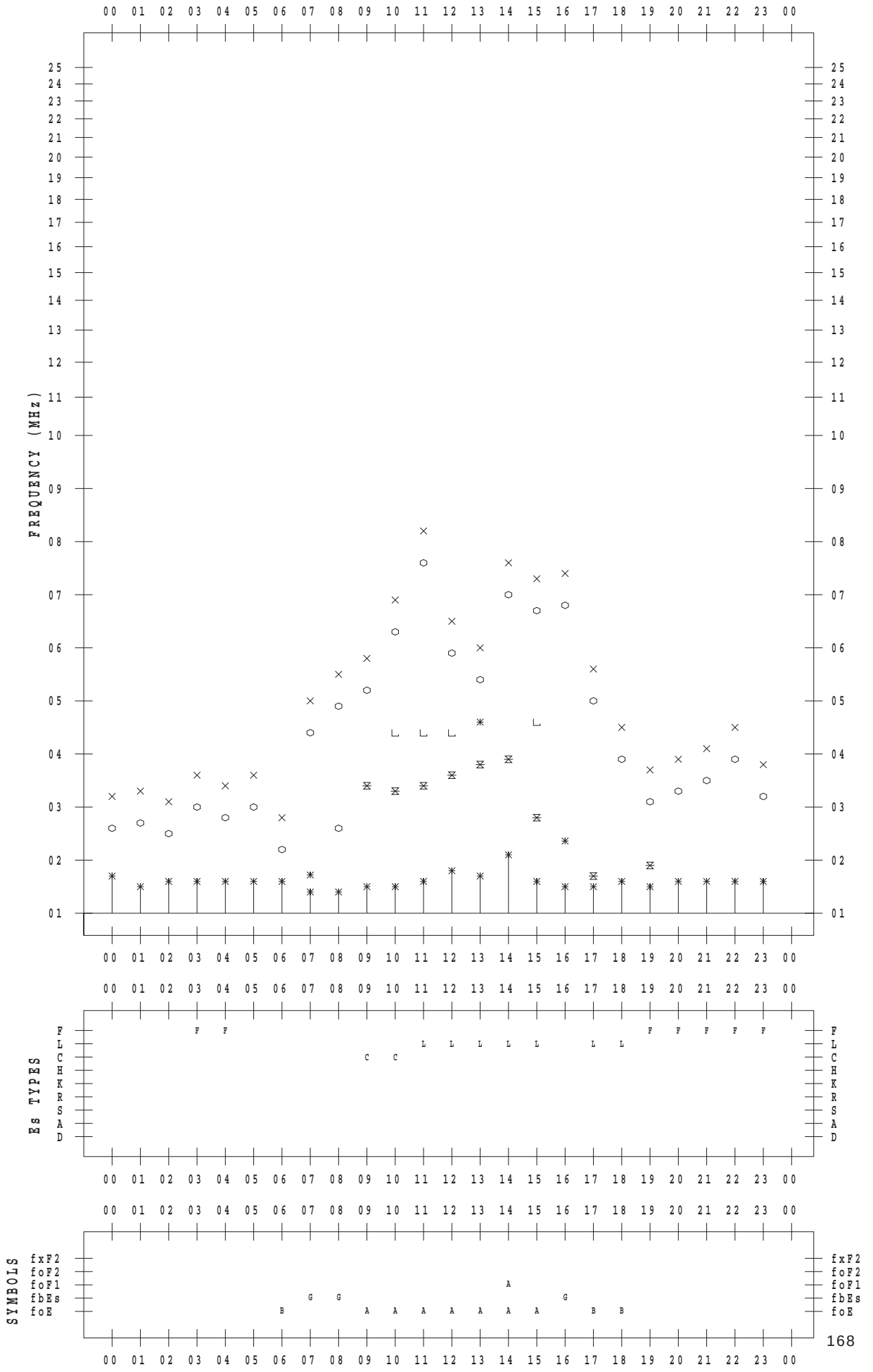
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018/11/ 1

135 °E MEAN TIME



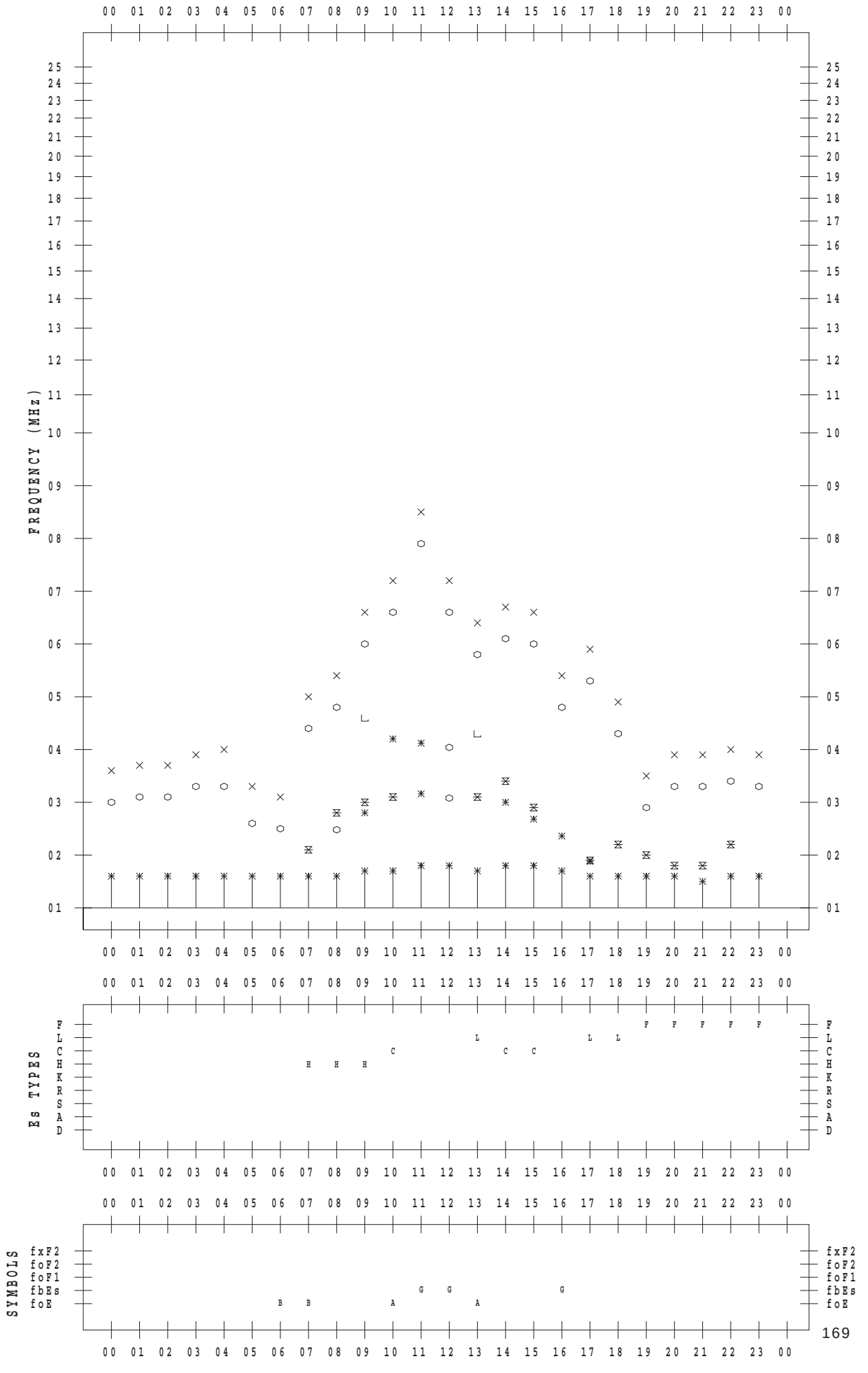
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018/11/ 2

135 °E MEAN TIME



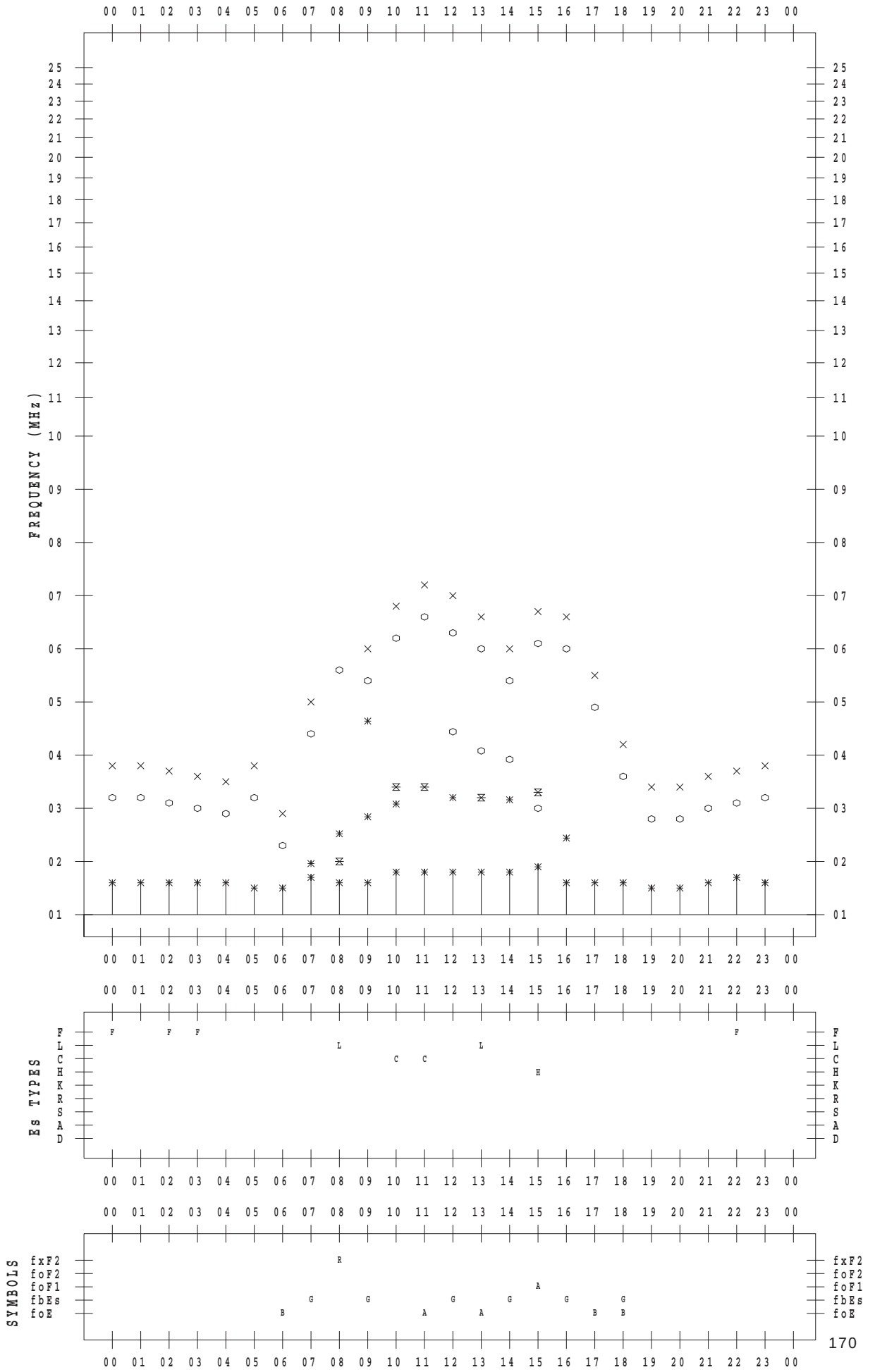
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018/11/ 3

135 °E MEAN TIME



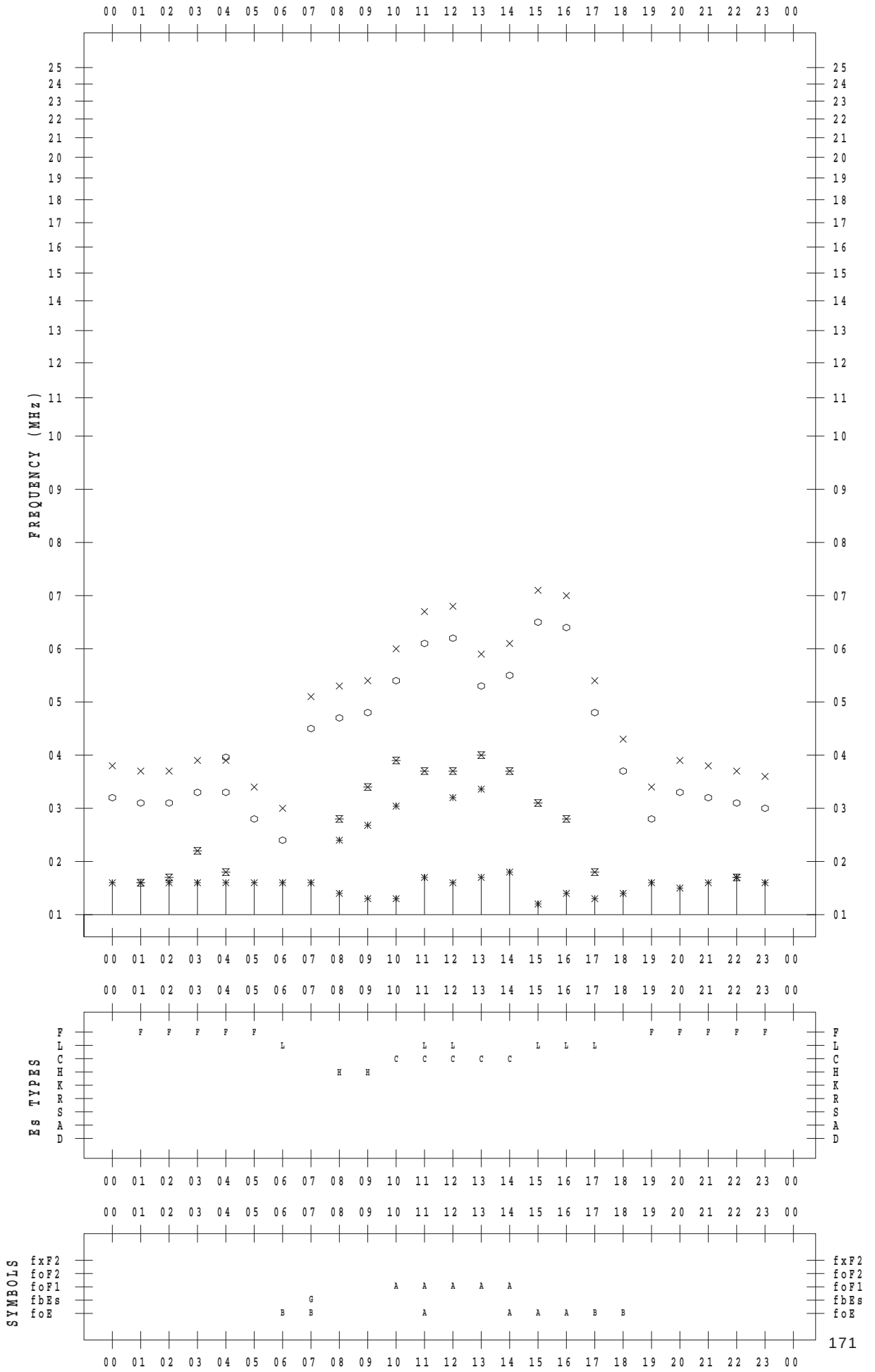
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018/11/ 4

135 °E MEAN TIME



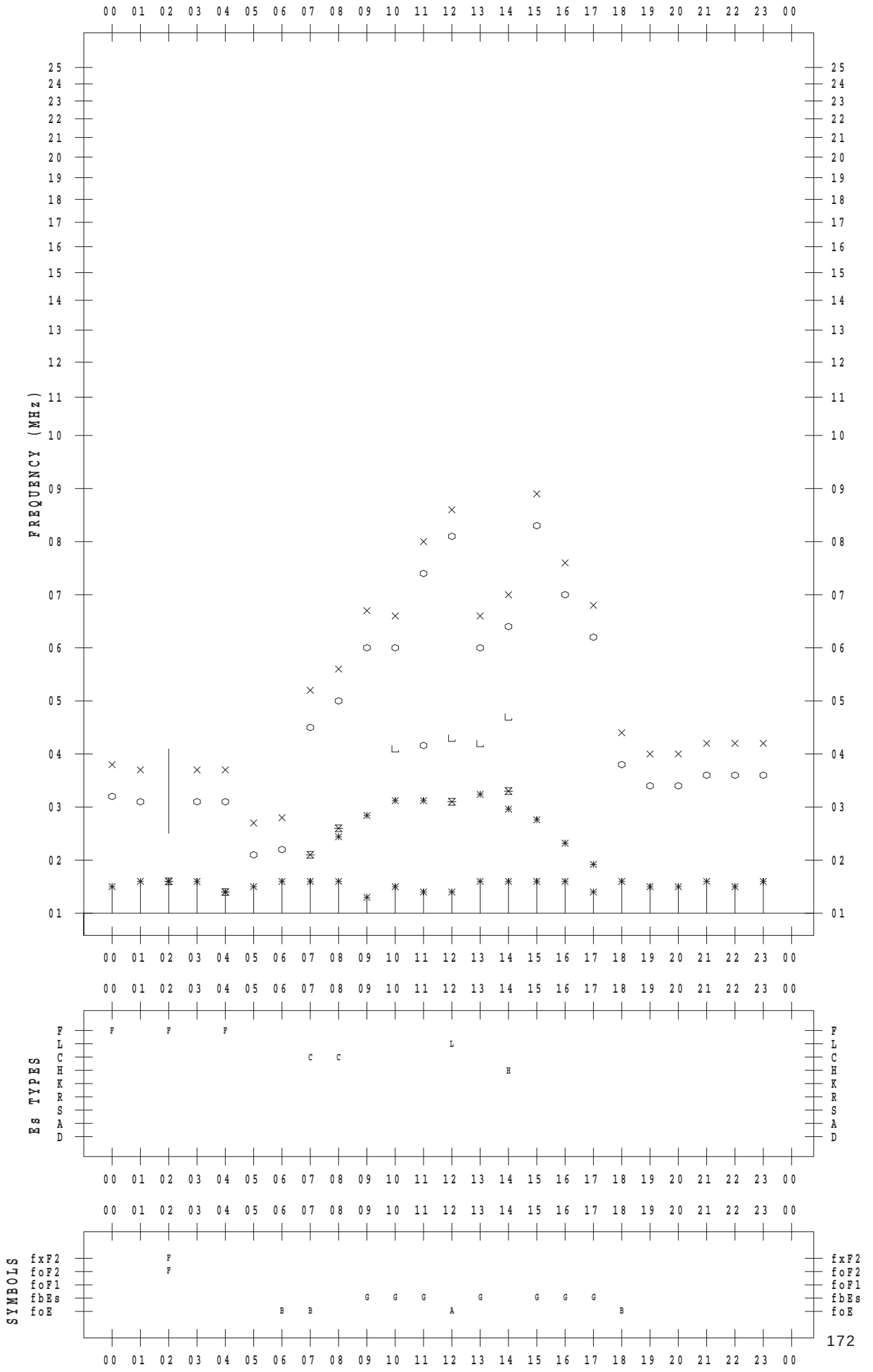
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018/11/ 5

135 °E MEAN TIME



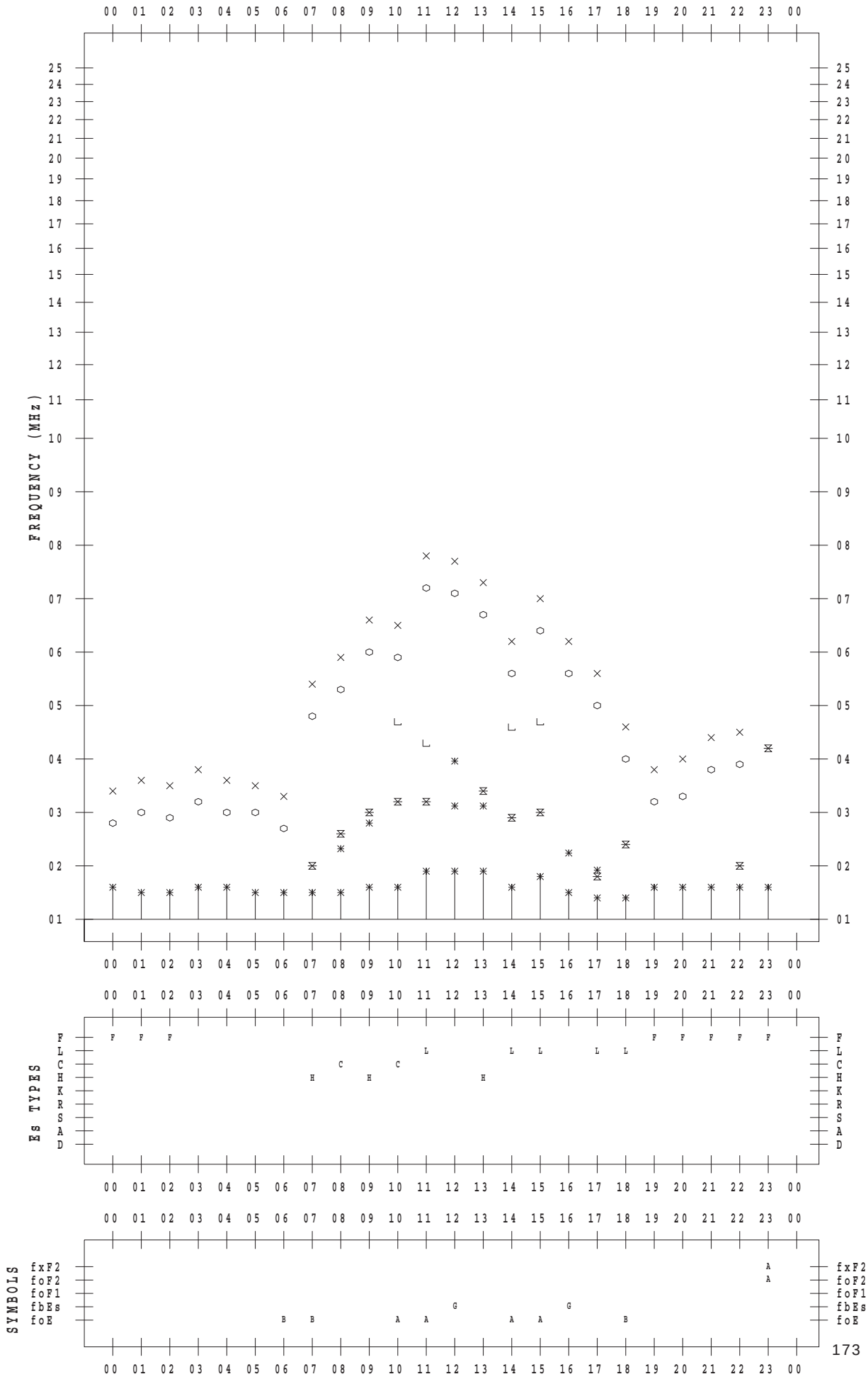
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018/11/ 6

135 °E MEAN TIME



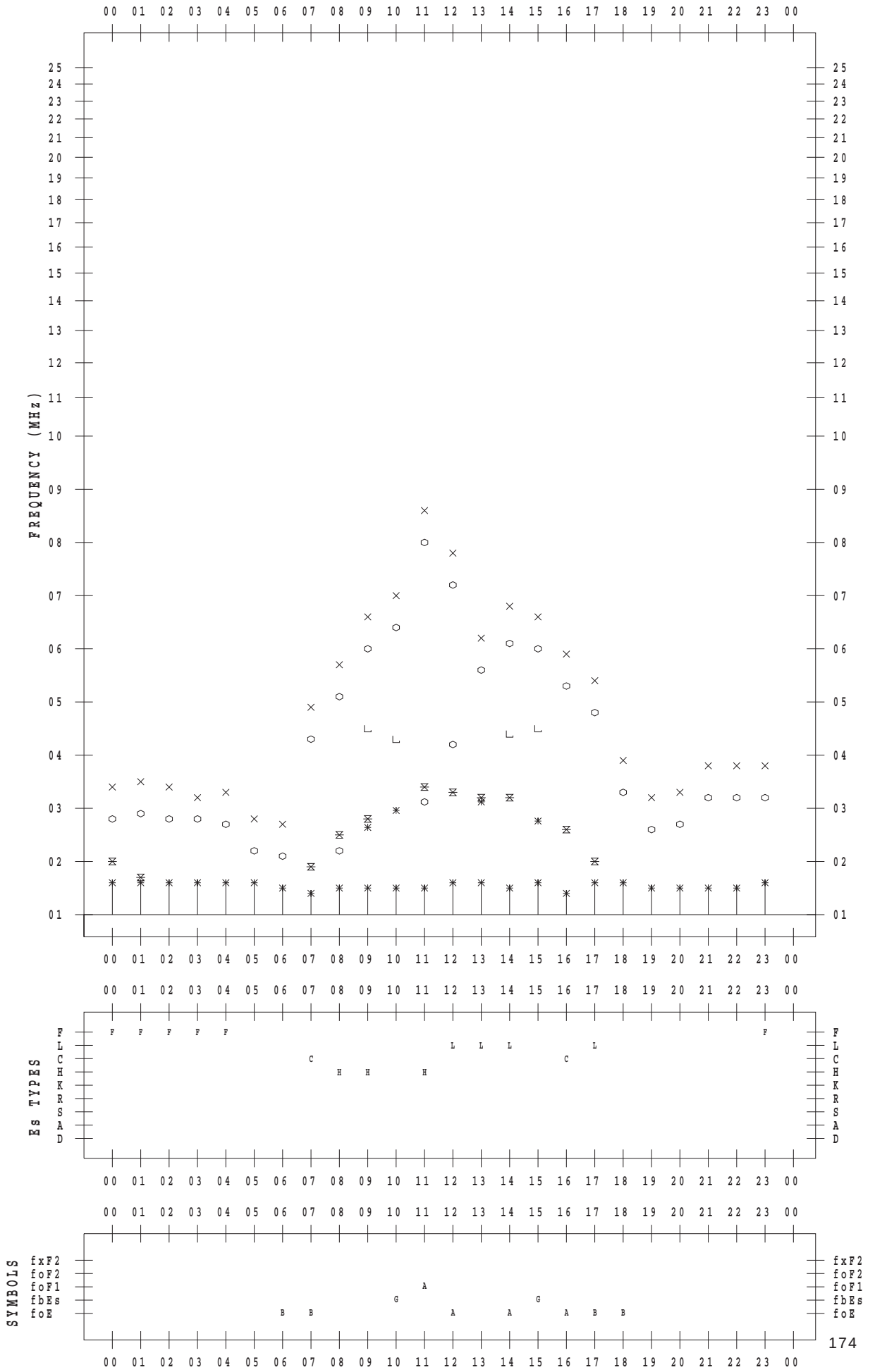
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018/11/ 7

135 °E MEAN TIME



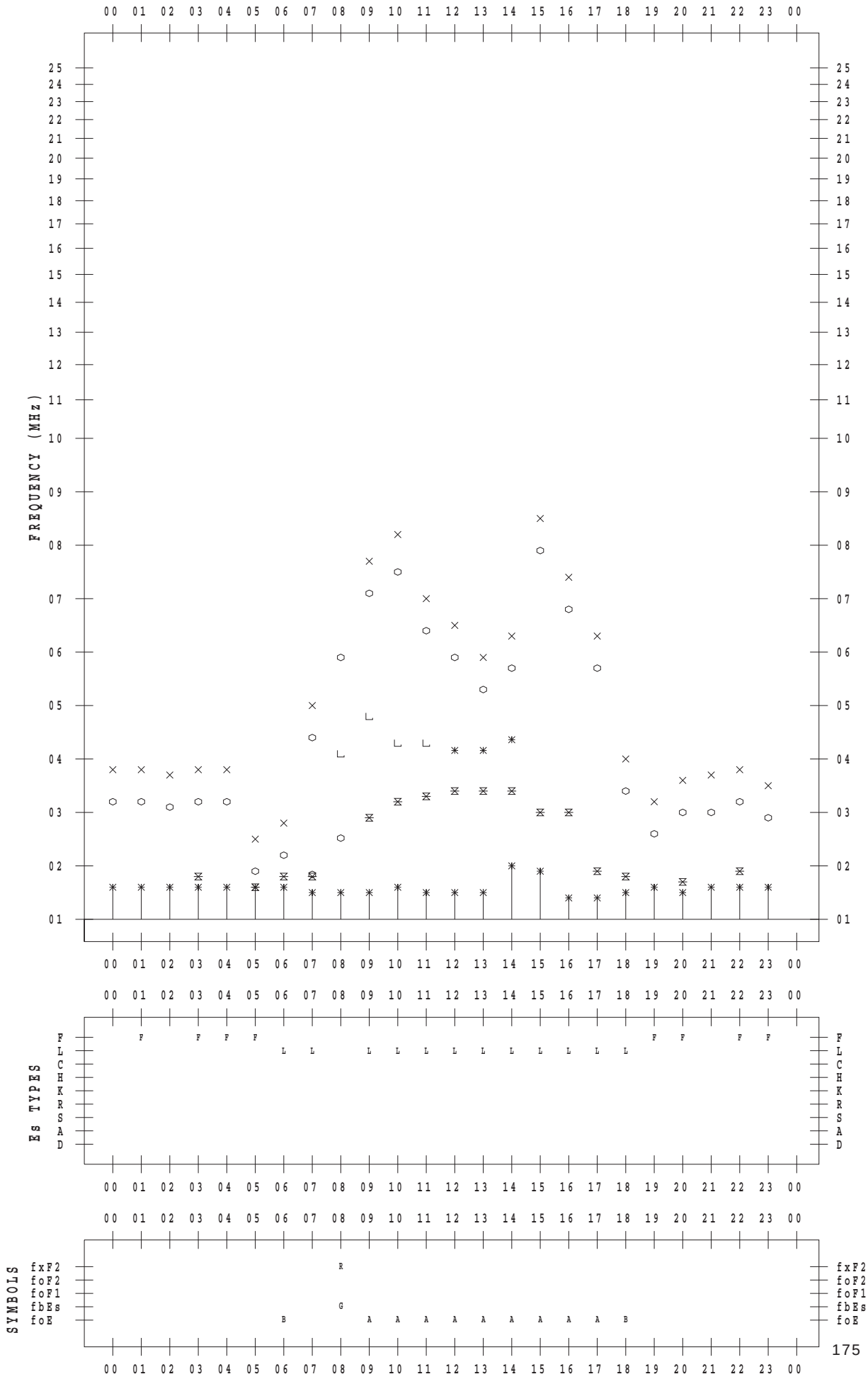
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018/11/ 8

135 °E MEAN TIME



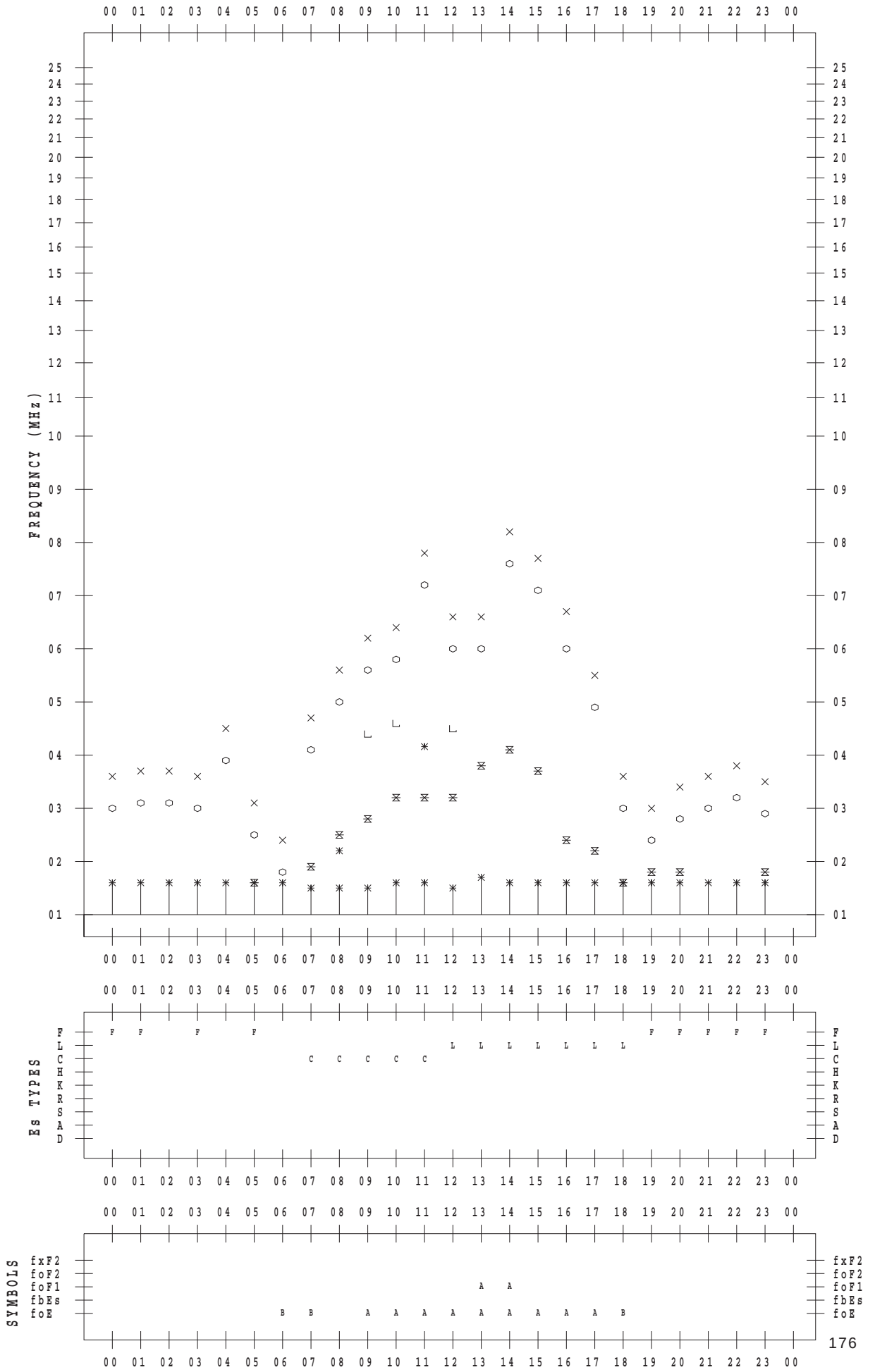
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018/11/ 9

135 °E MEAN TIME



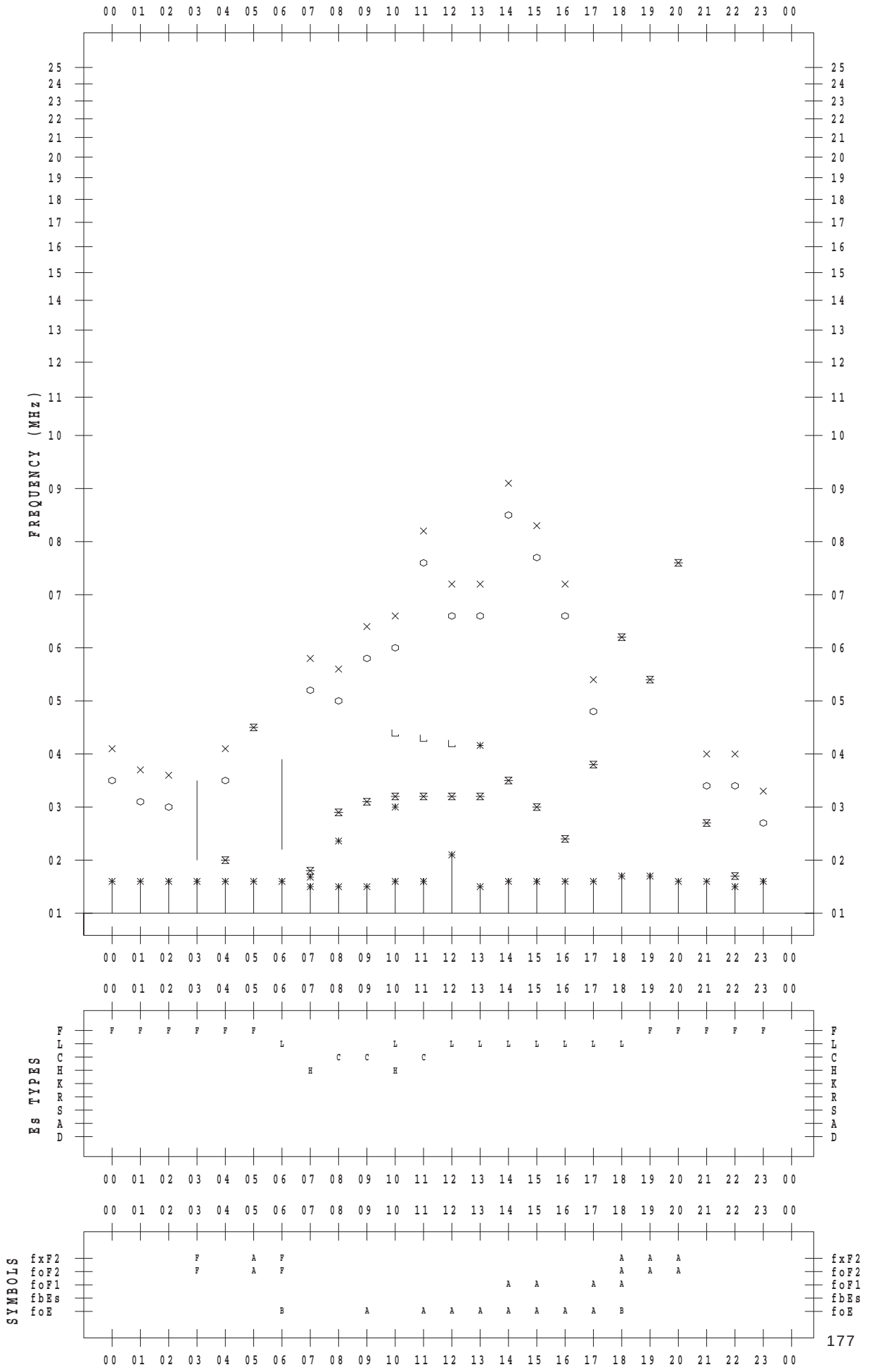
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018/11/10

135 °E MEAN TIME



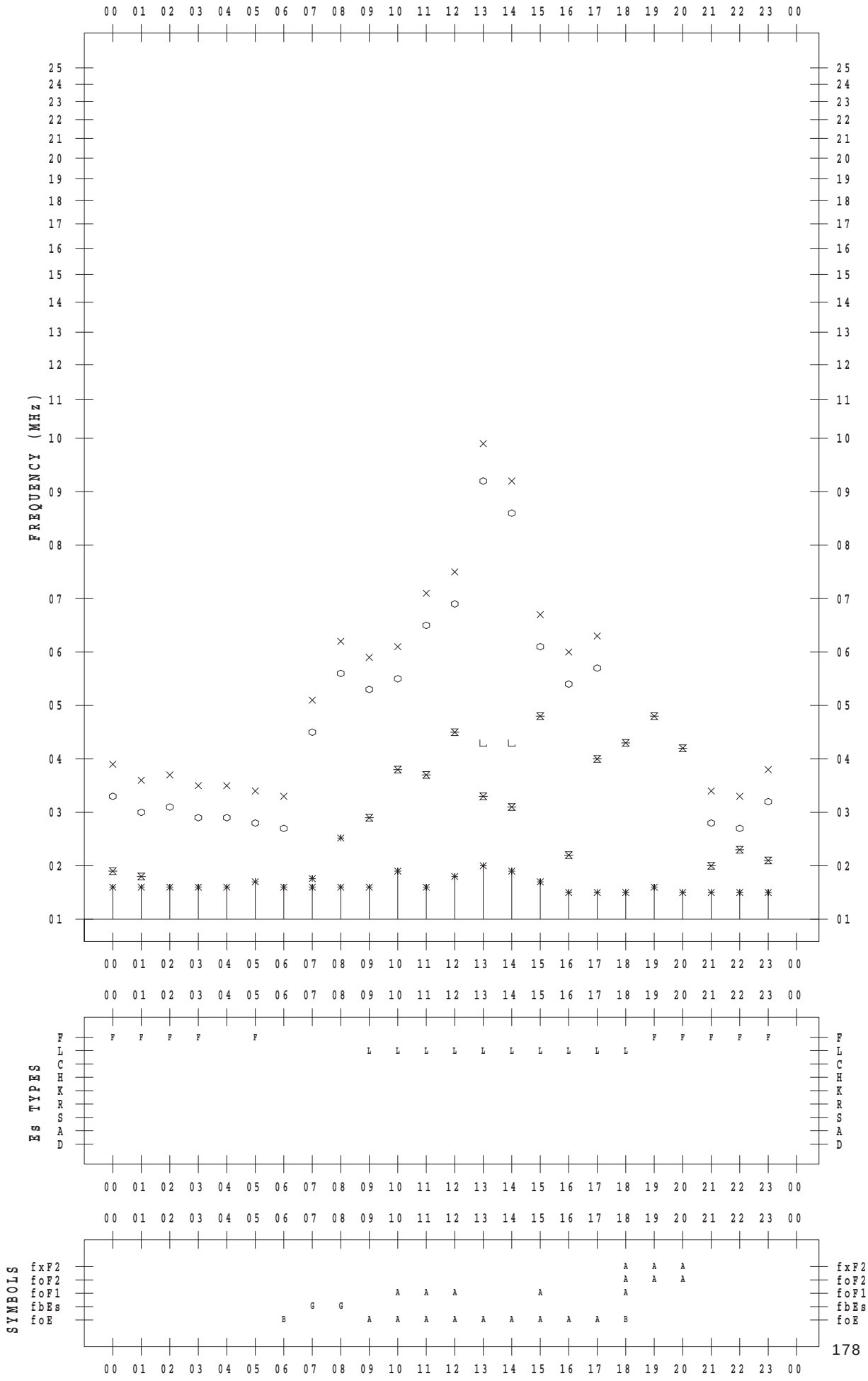
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018/11/11

135 °E MEAN TIME



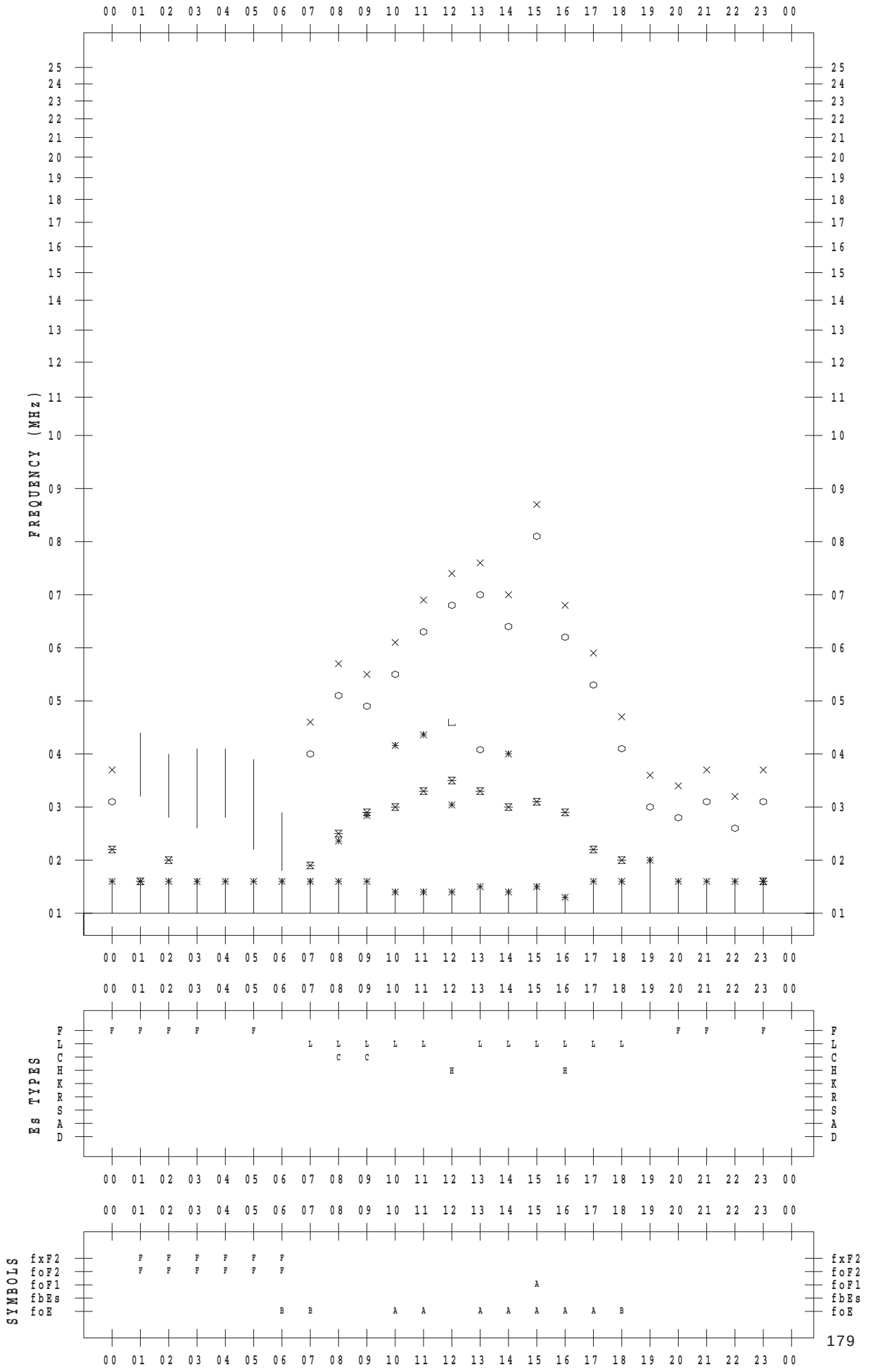
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018/11/12

135 °E MEAN TIME



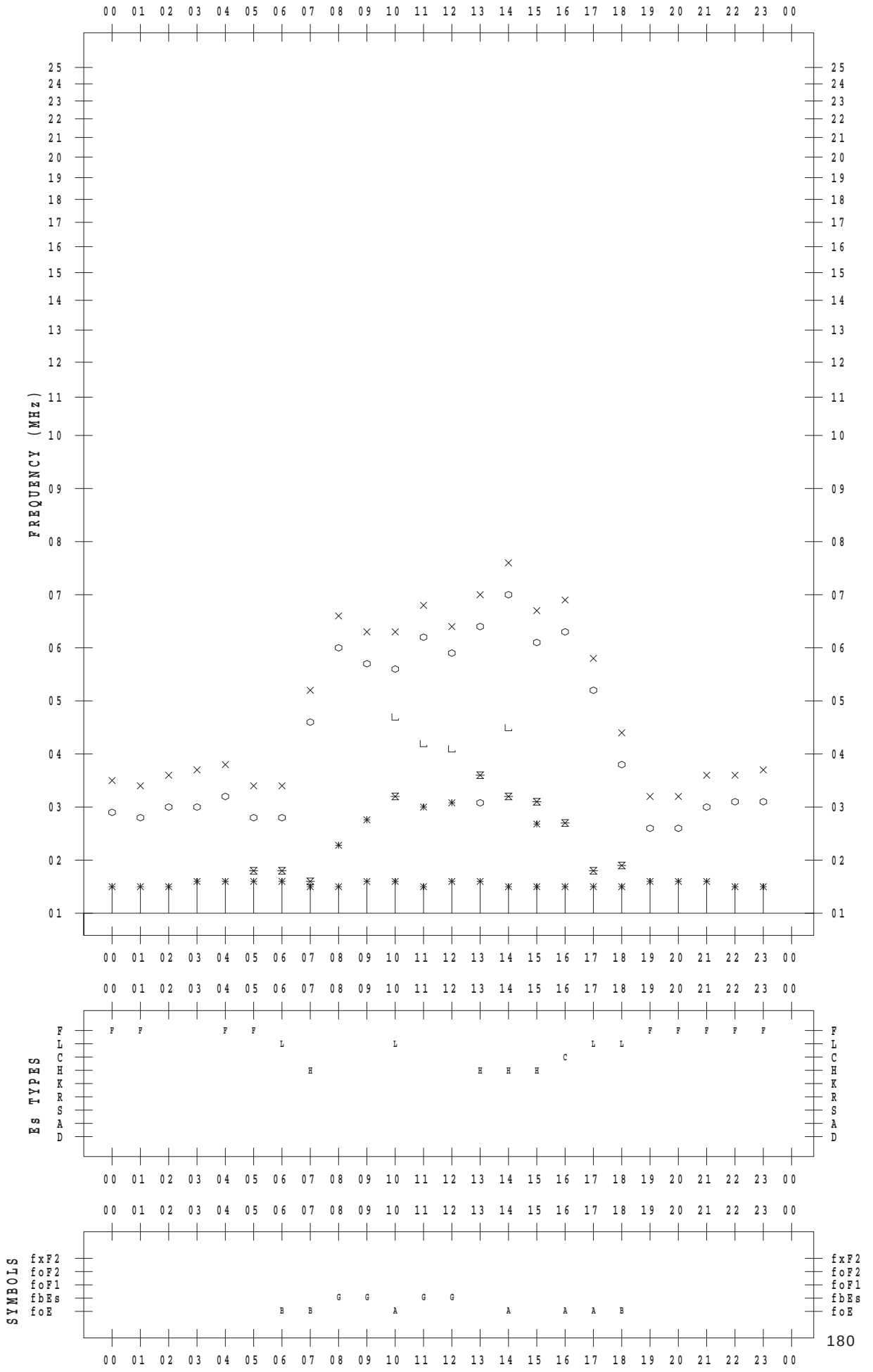
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018/11/13

135 °E MEAN TIME



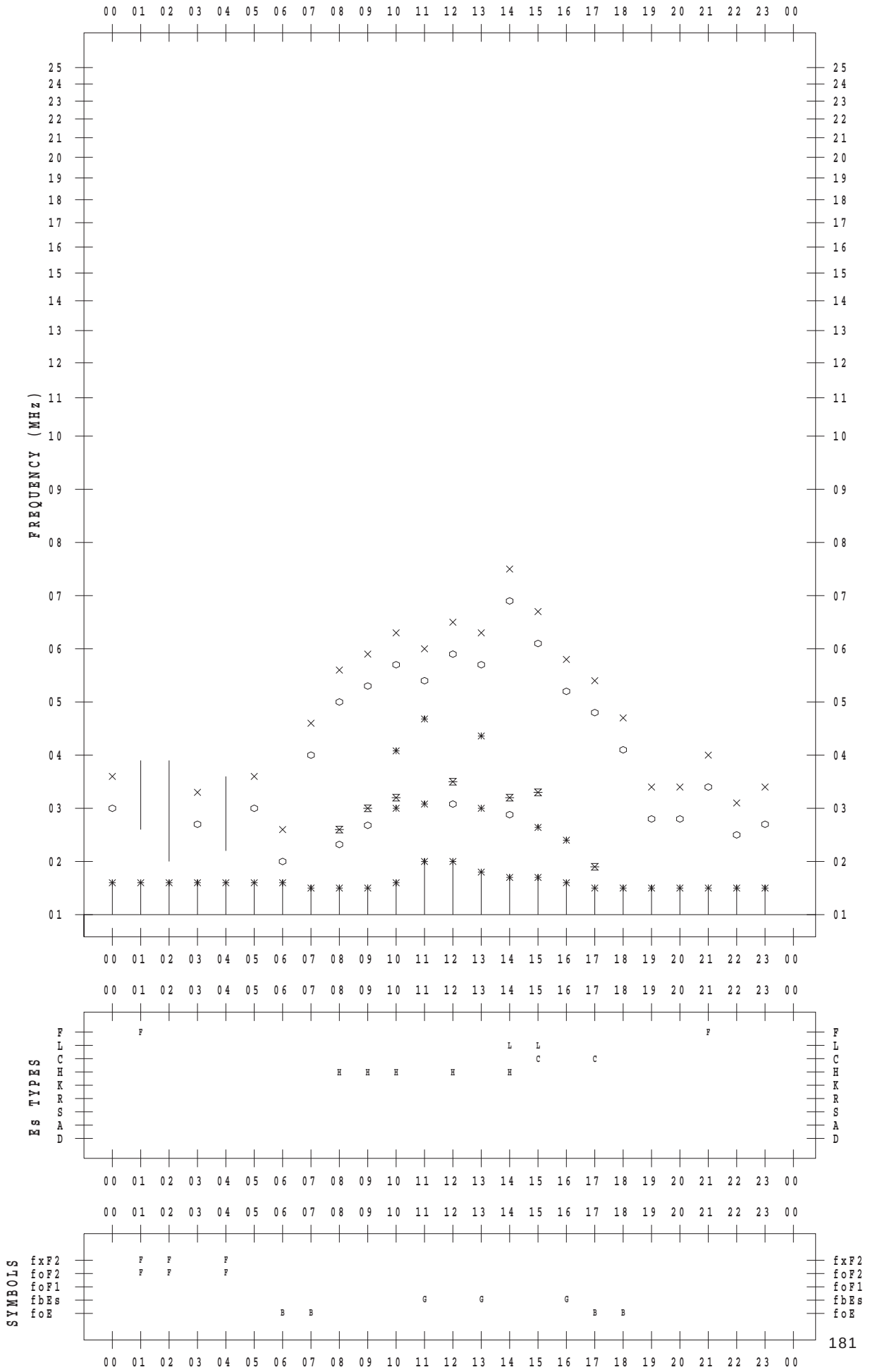
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018/11/14

135 °E MEAN TIME



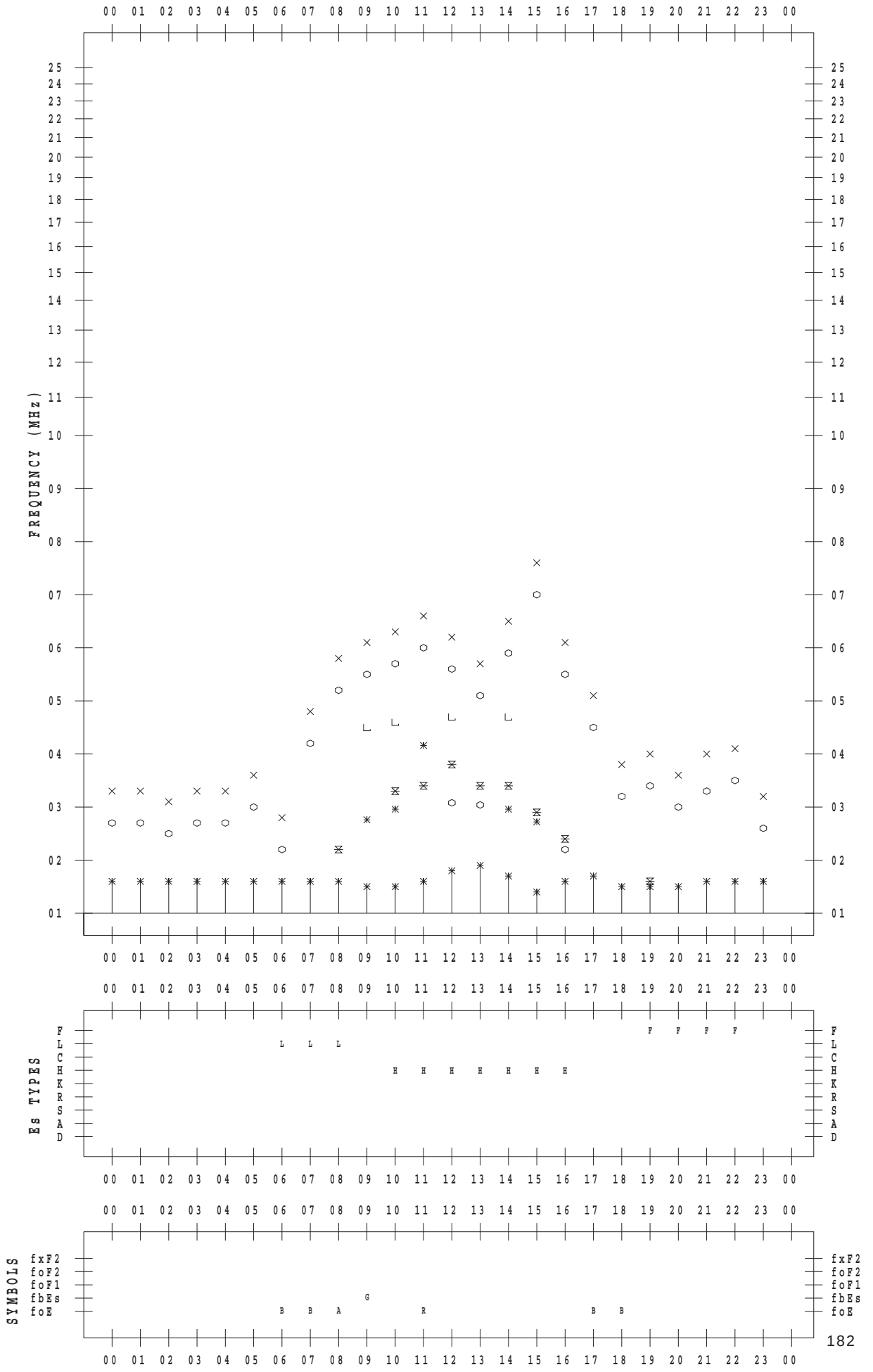
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018/11/15

135 °E MEAN TIME



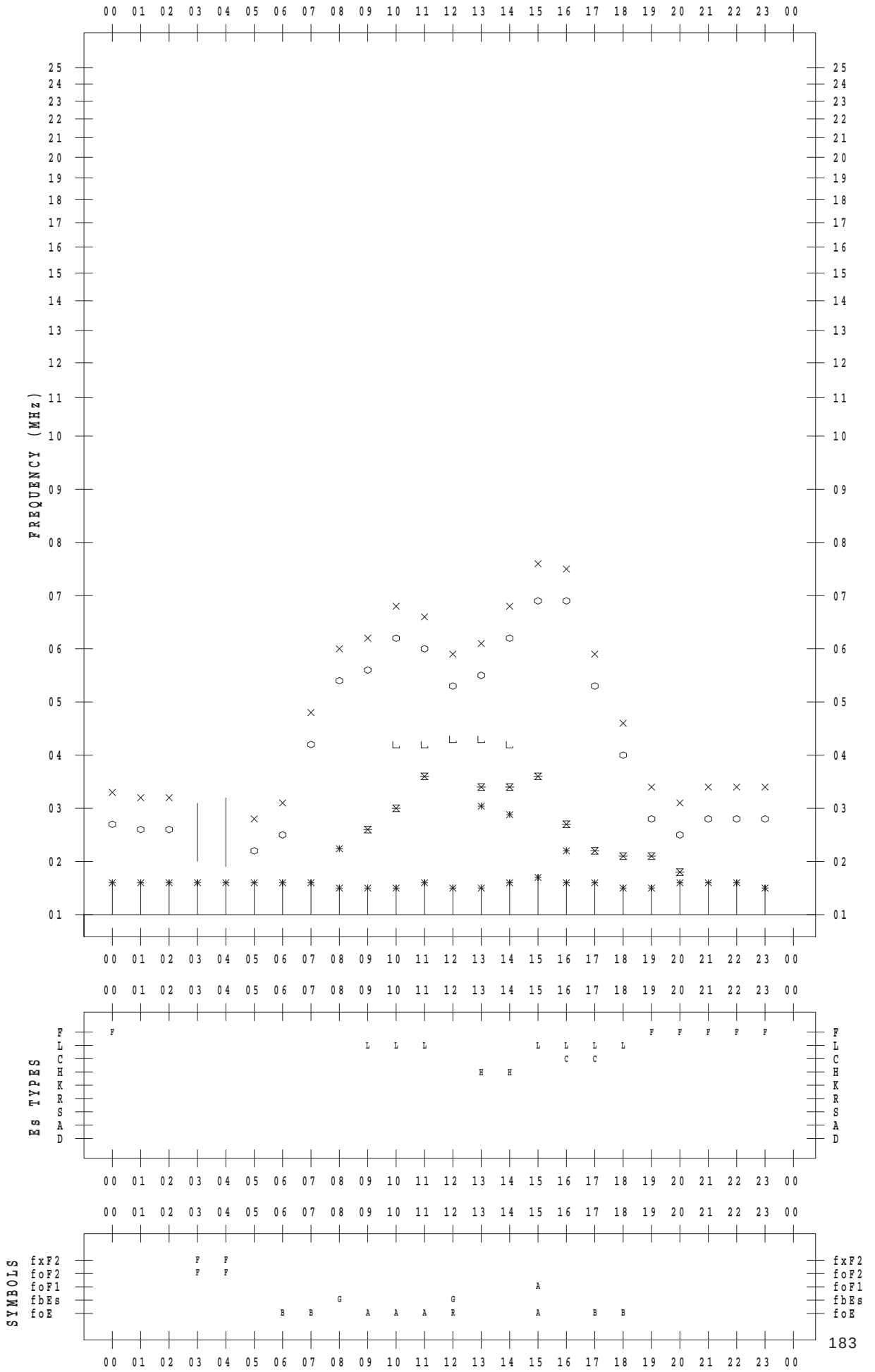
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018/11/16

135 °E MEAN TIME



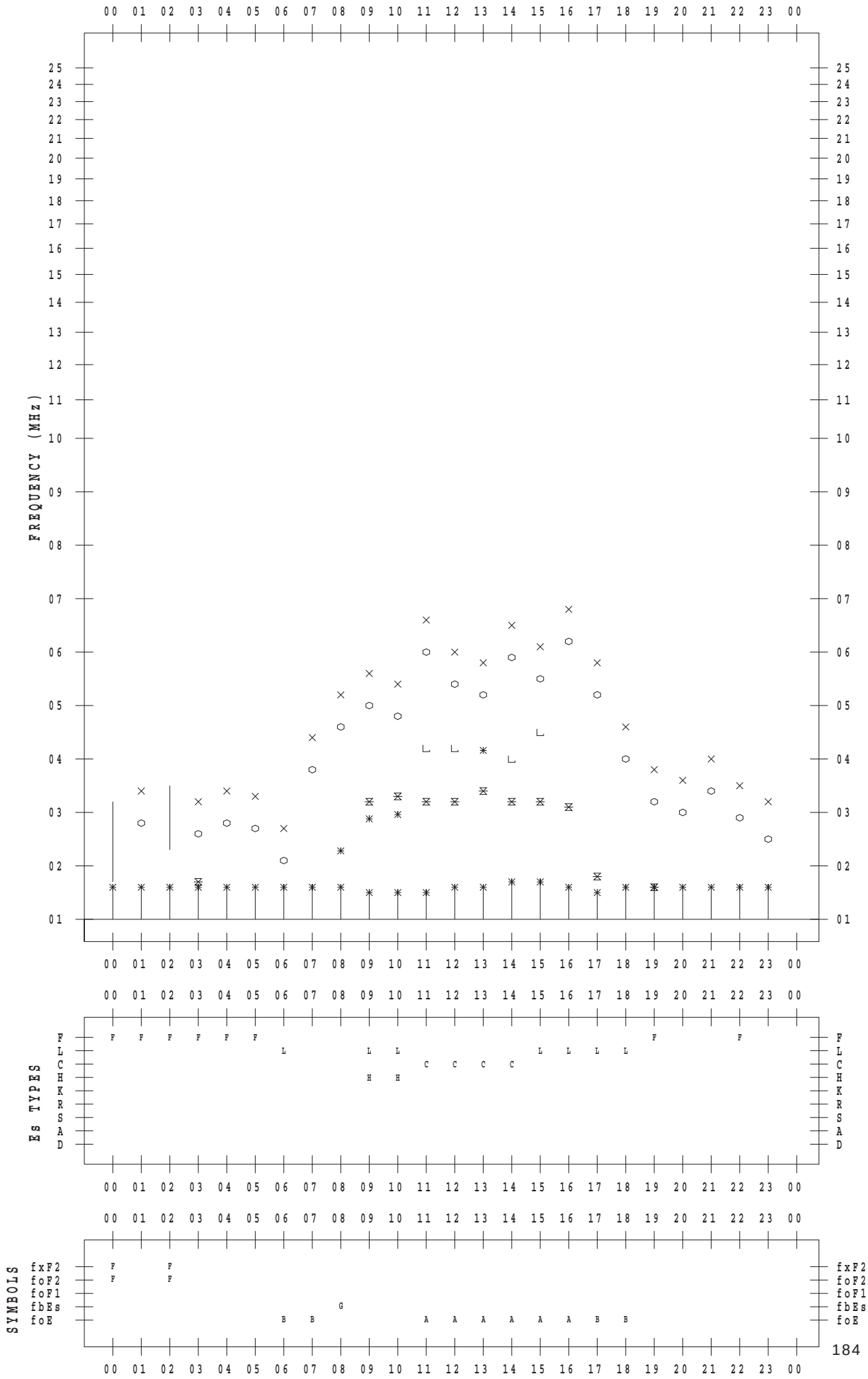
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018/11/17

135 °E MEAN TIME



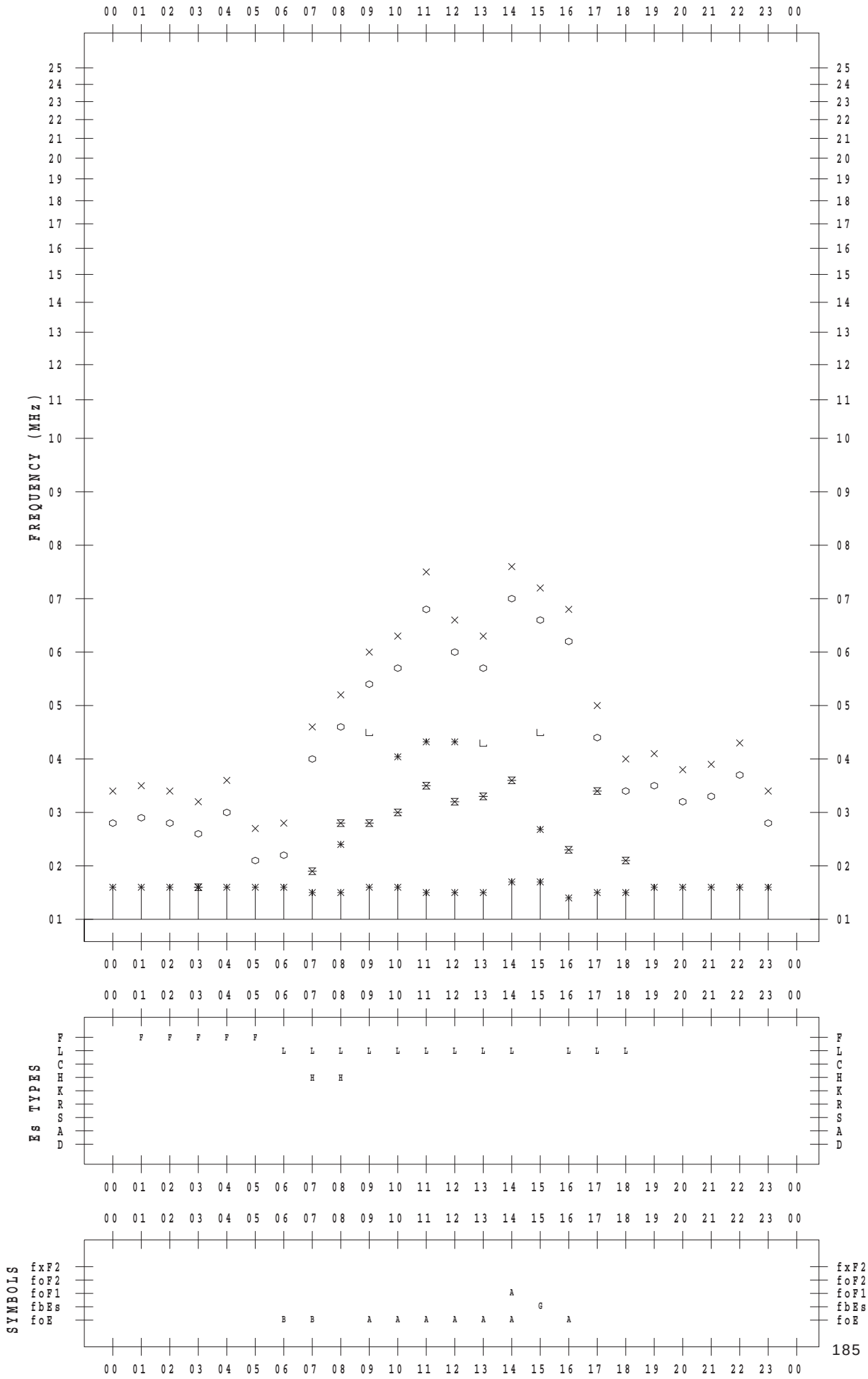
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018/11/18

135 °E MEAN TIME



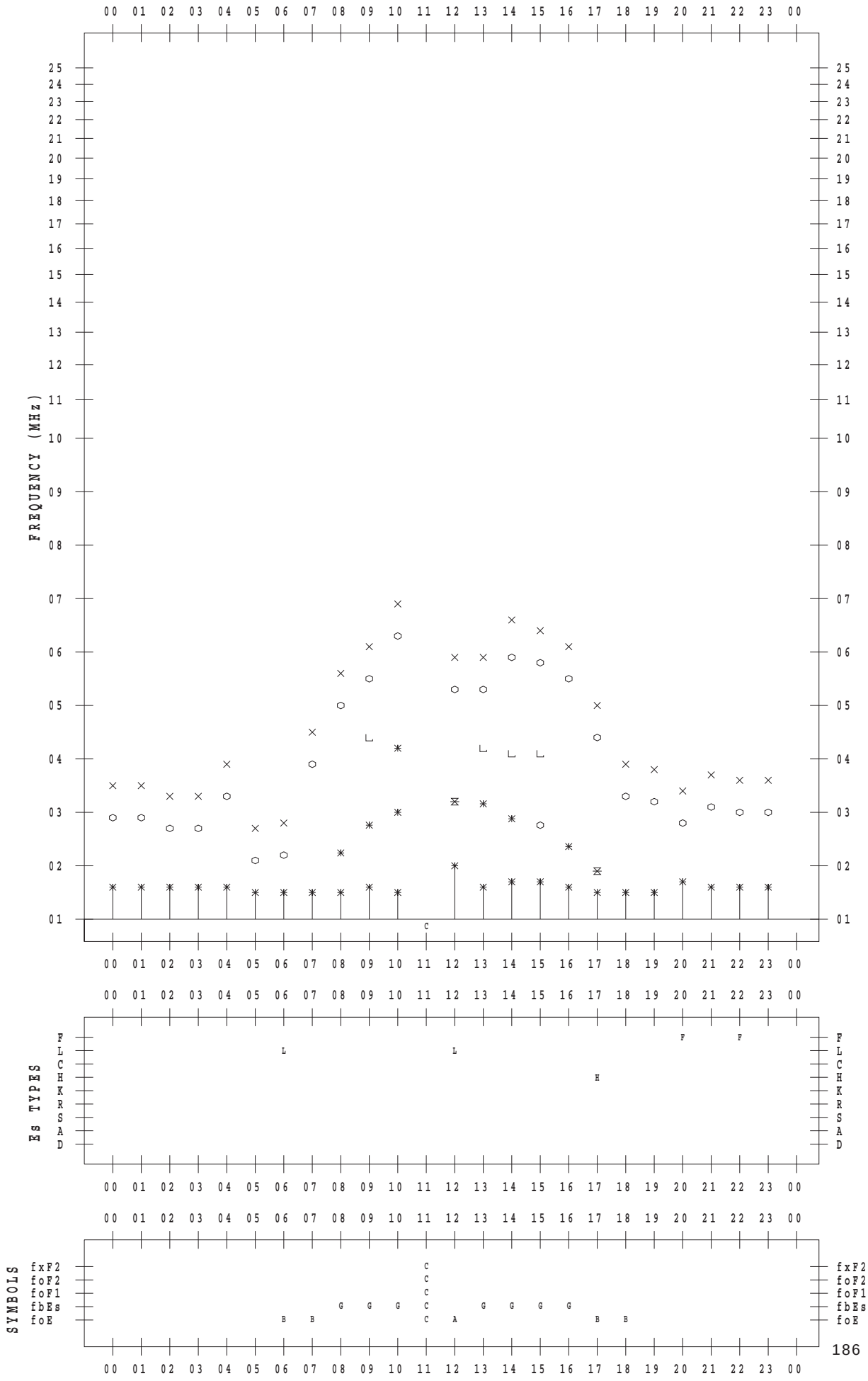
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018/11/19

135 °E MEAN TIME



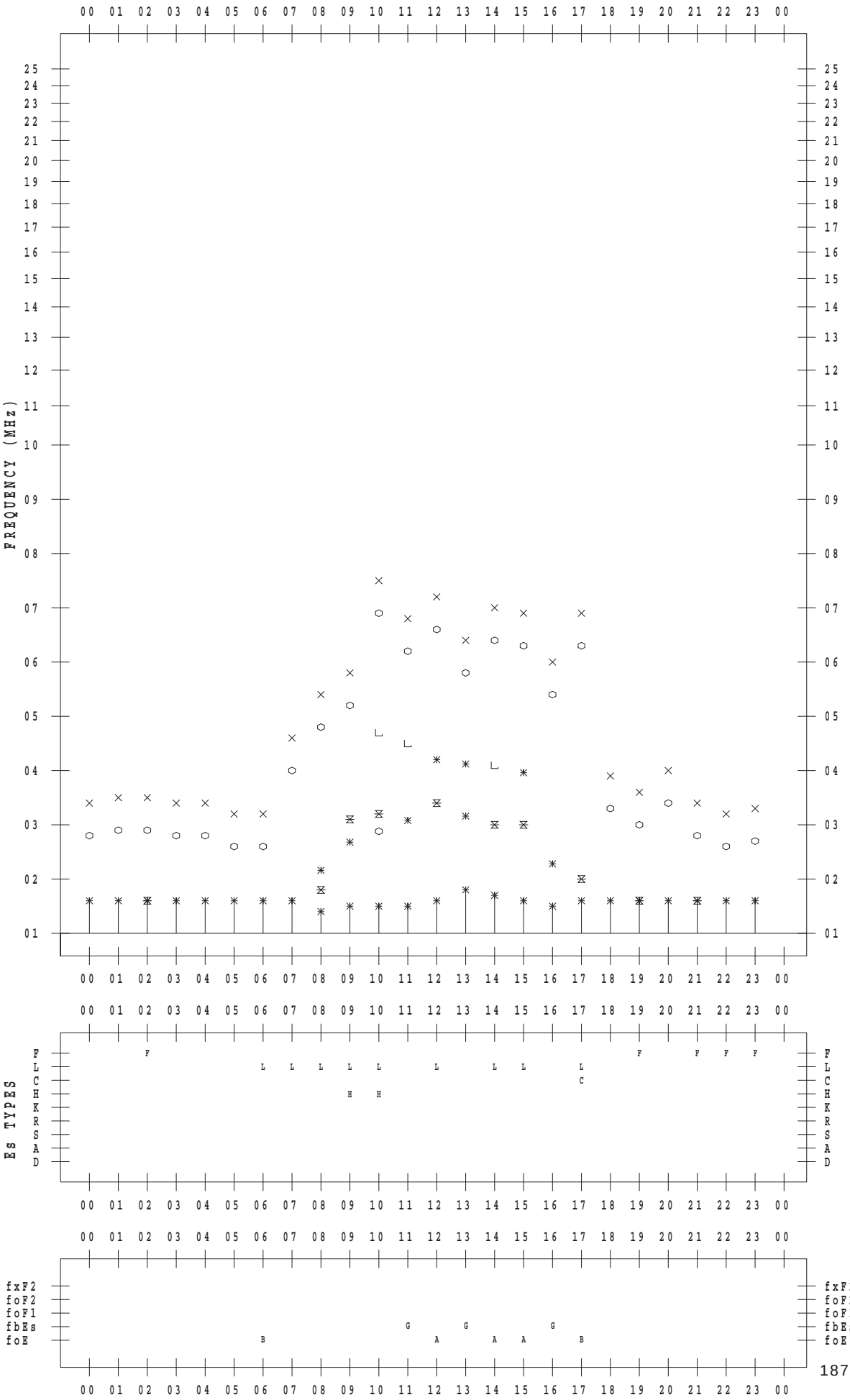
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018/11/20

135 °E MEAN TIME



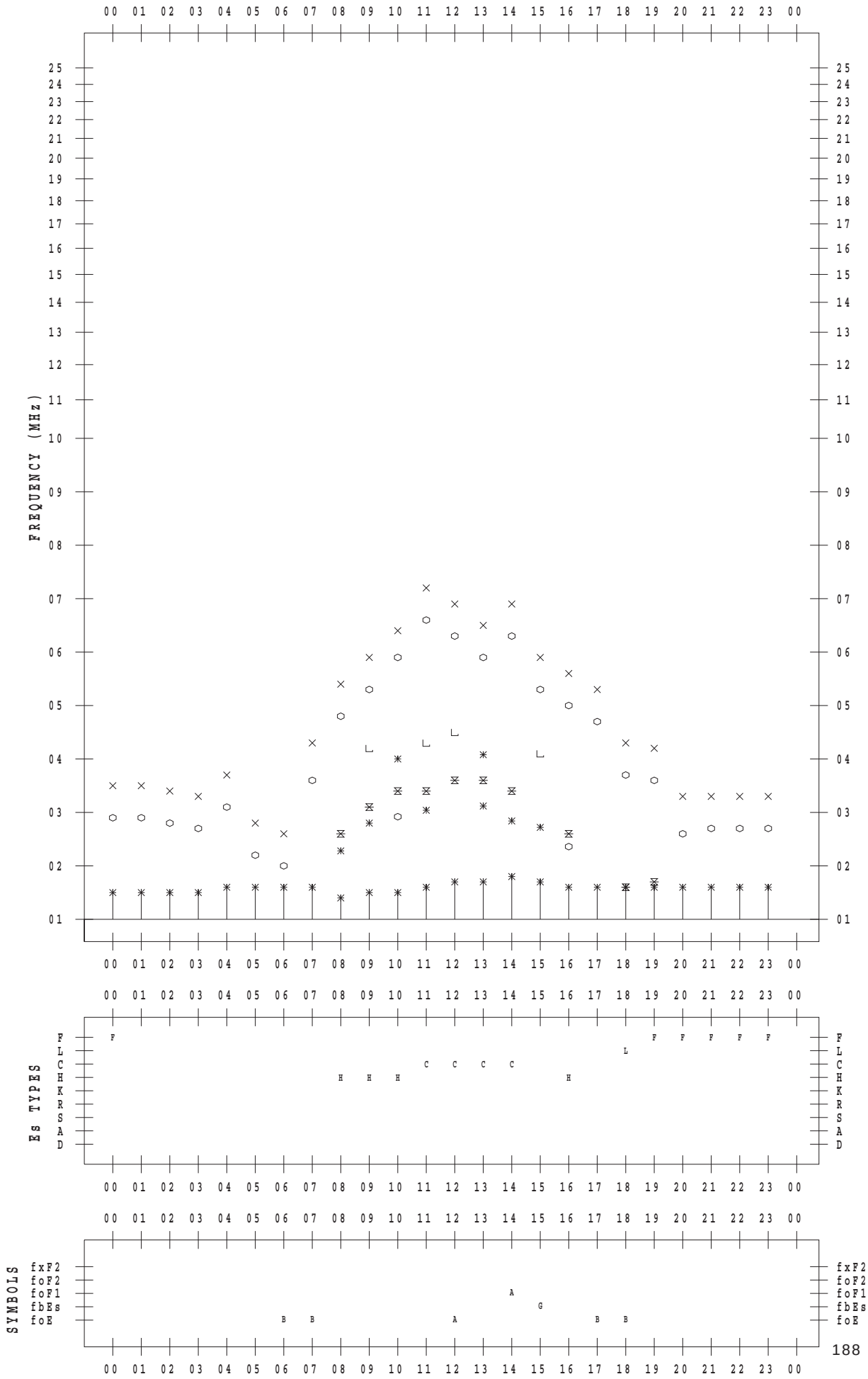
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018/11/21

135 °E MEAN TIME



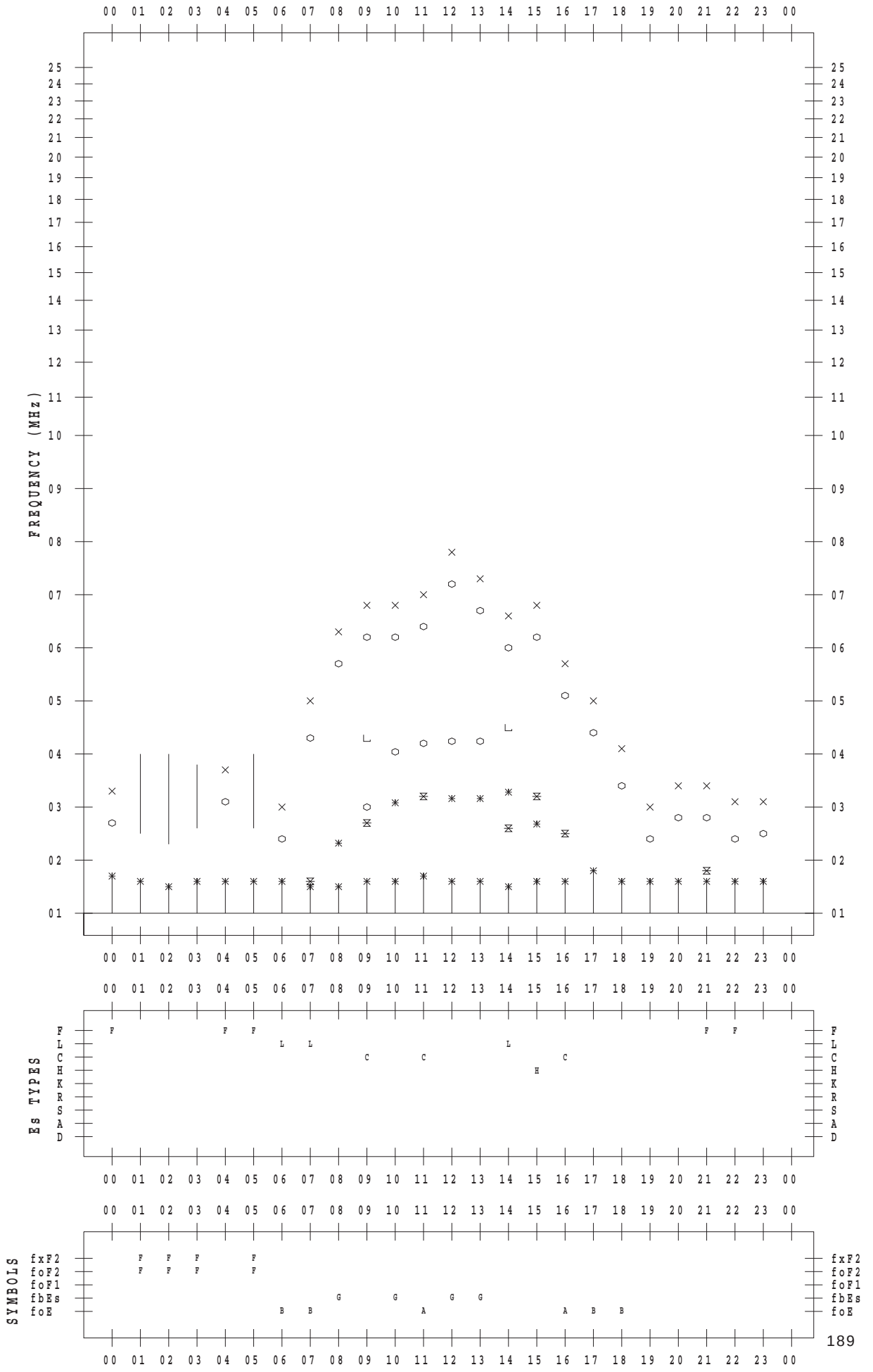
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018/11/22

135 °E MEAN TIME



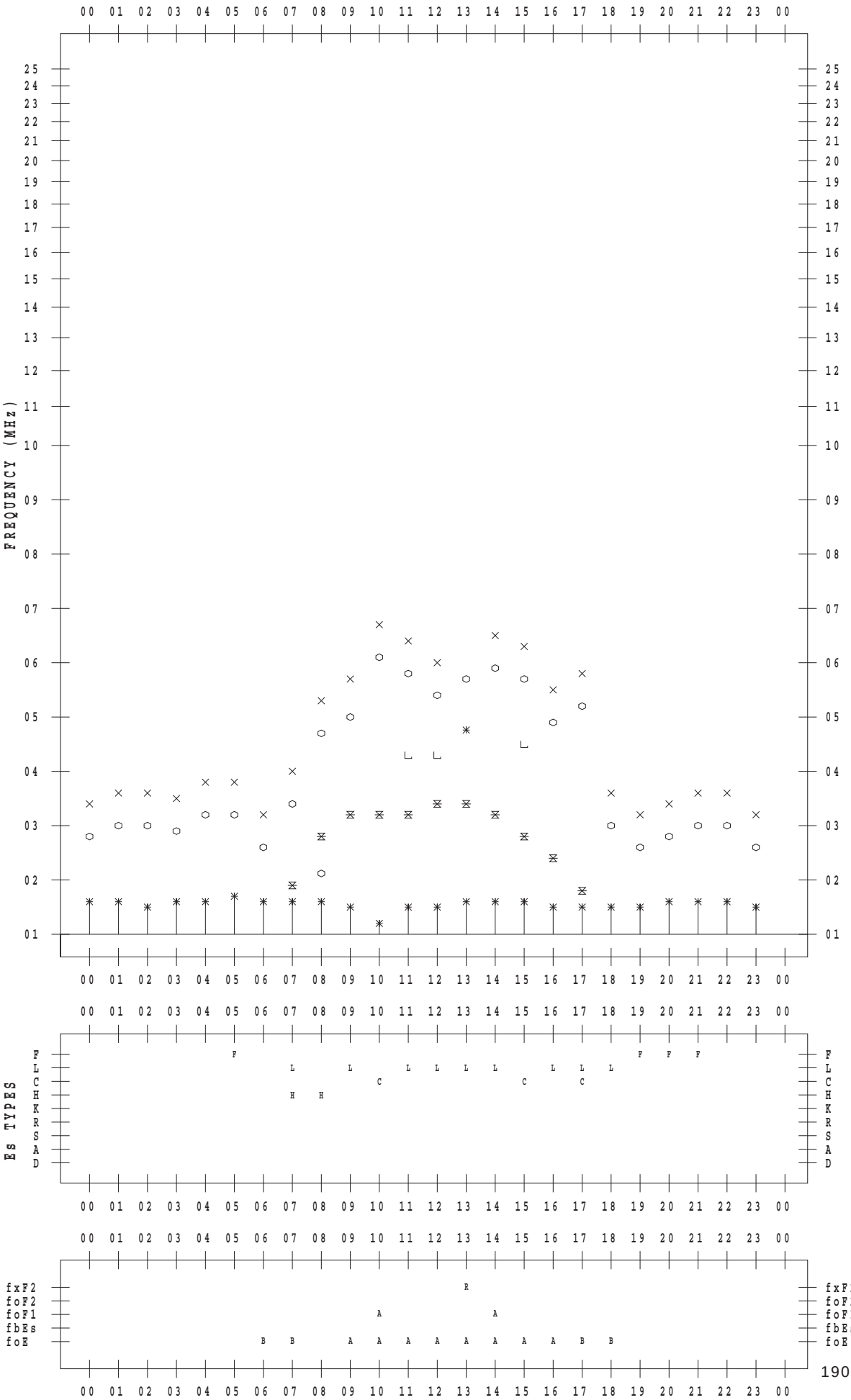
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018/11/23

135 °E MEAN TIME



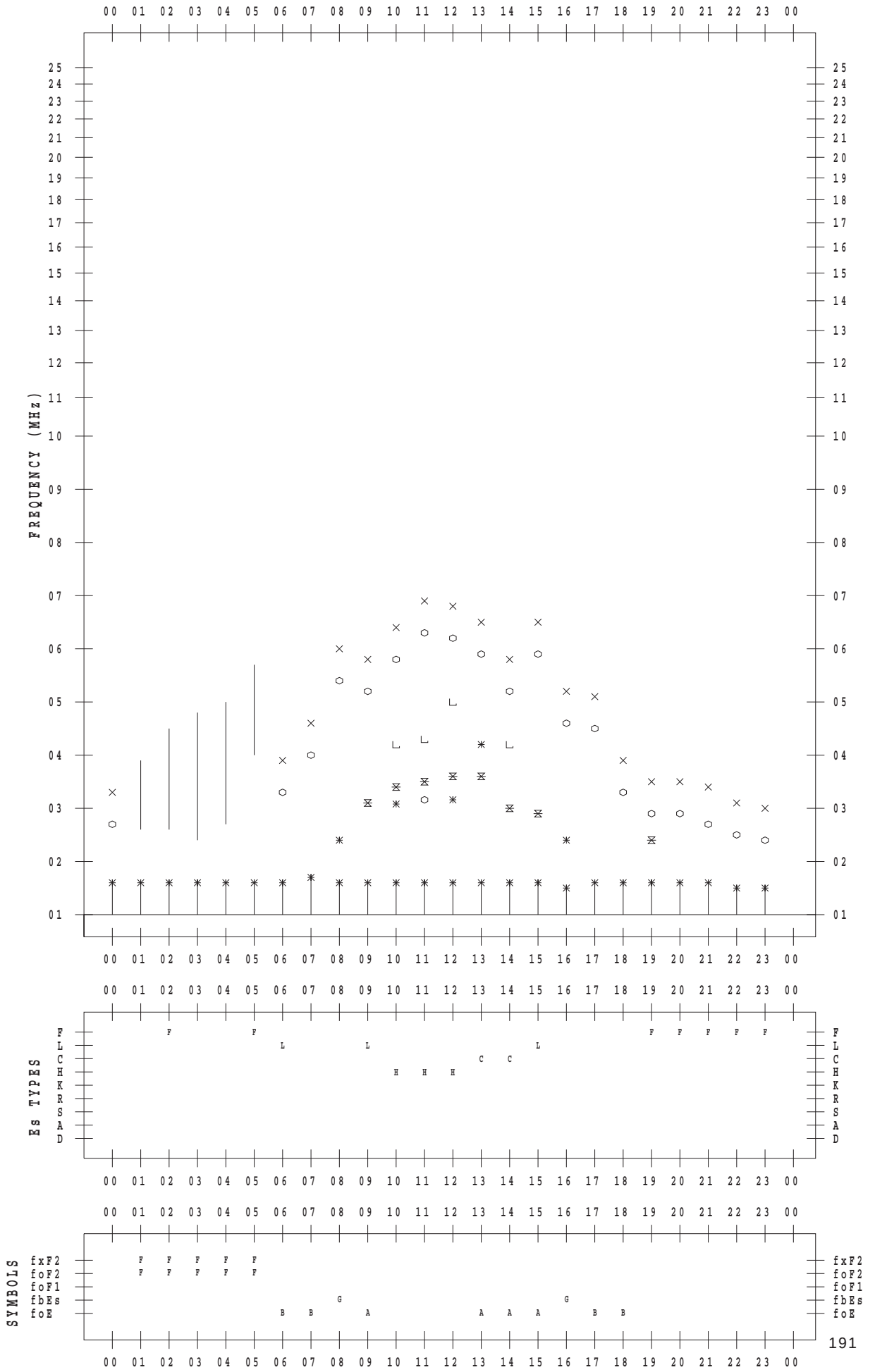
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018/11/24

135 °E MEAN TIME



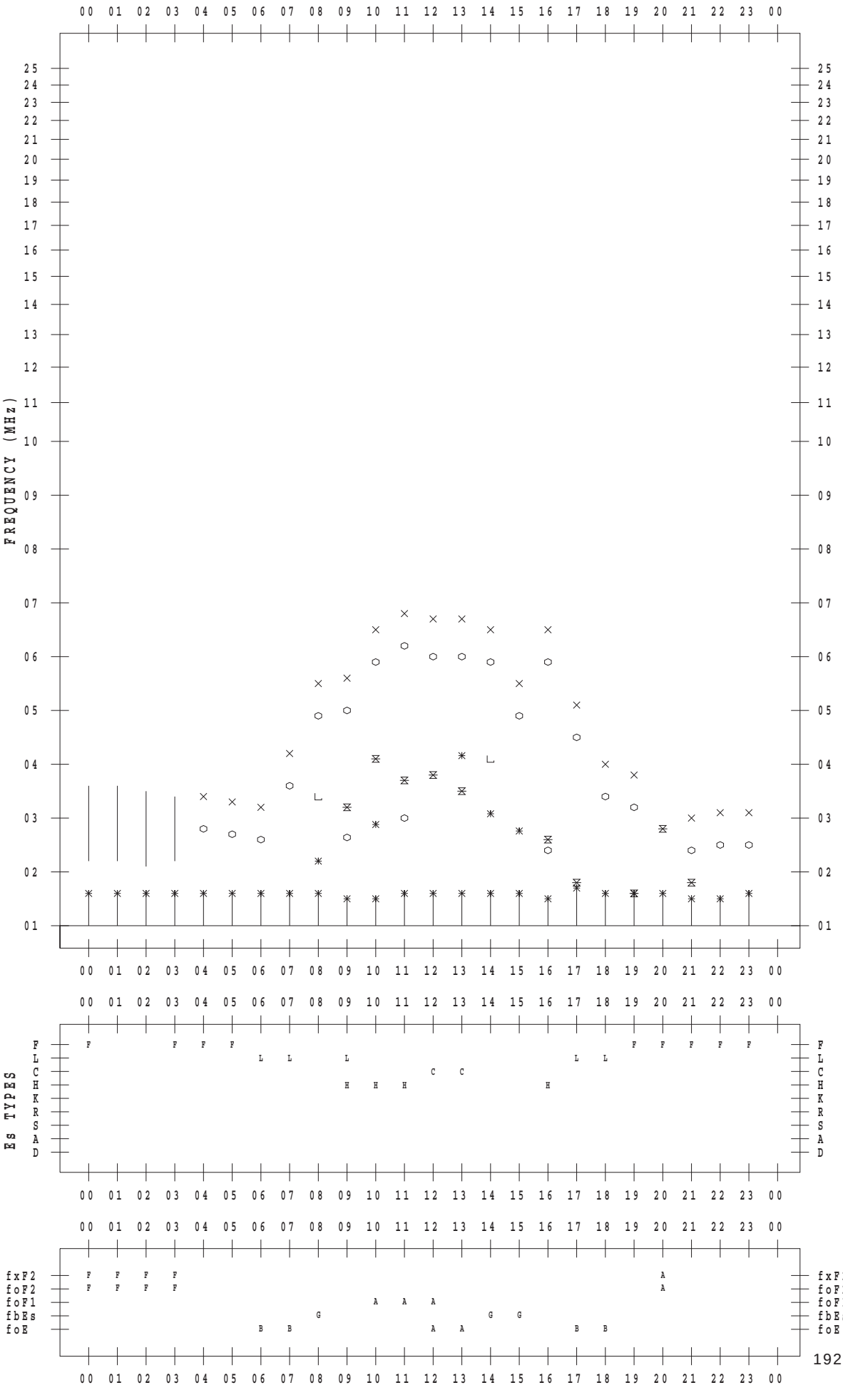
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018/11/25

135 °E MEAN TIME



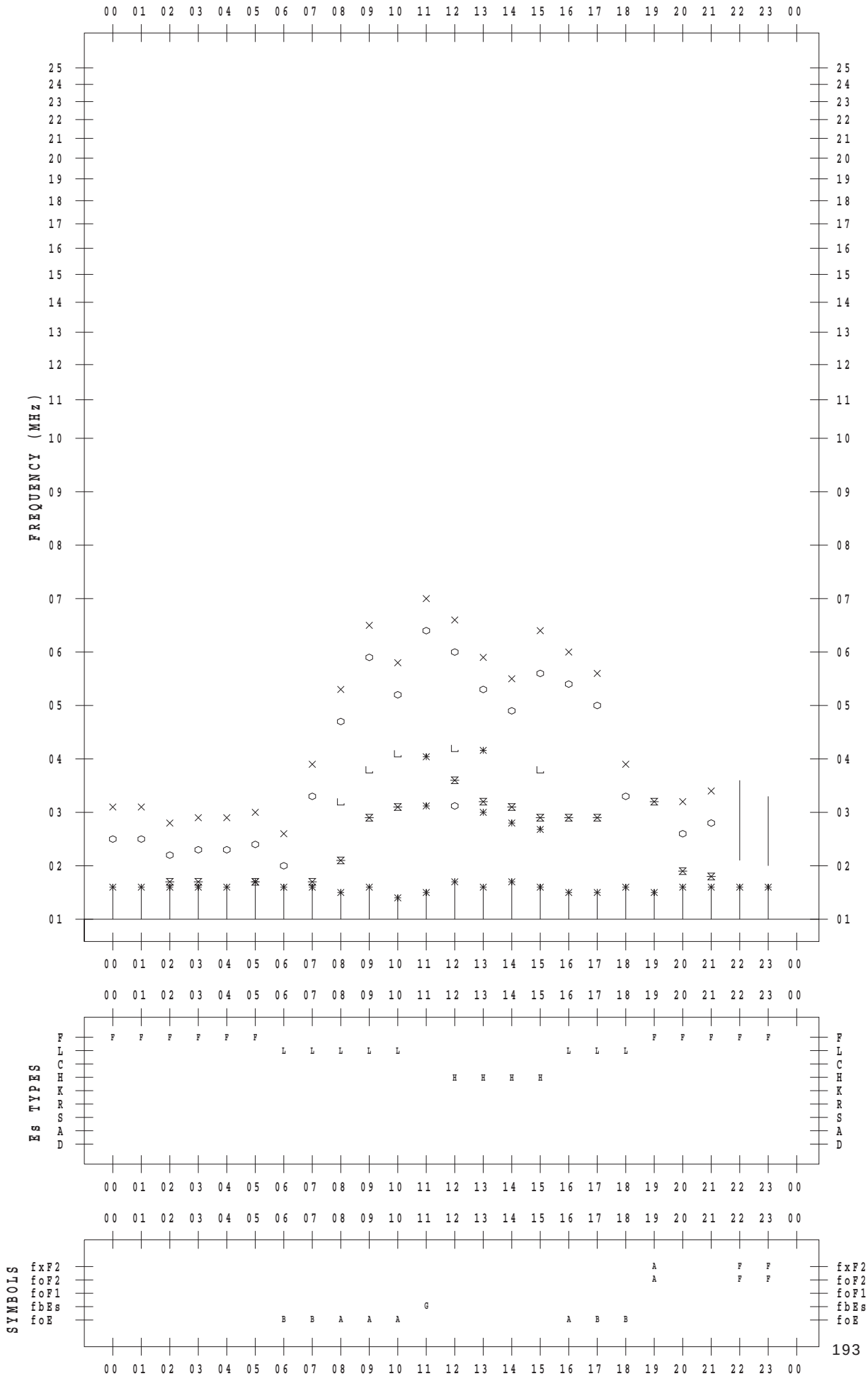
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018/11/26

135 °E MEAN TIME



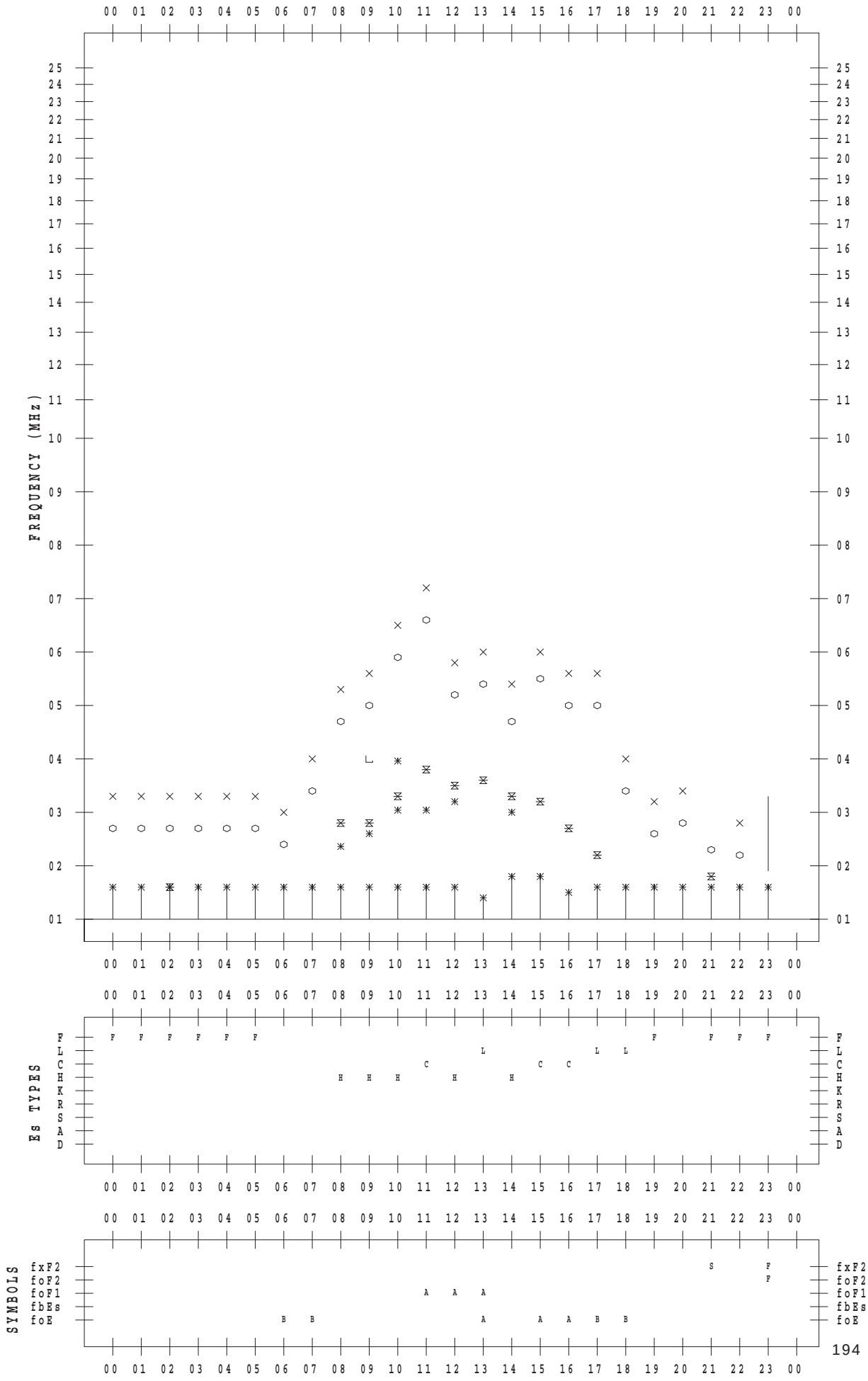
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018/11/27

135 °E MEAN TIME



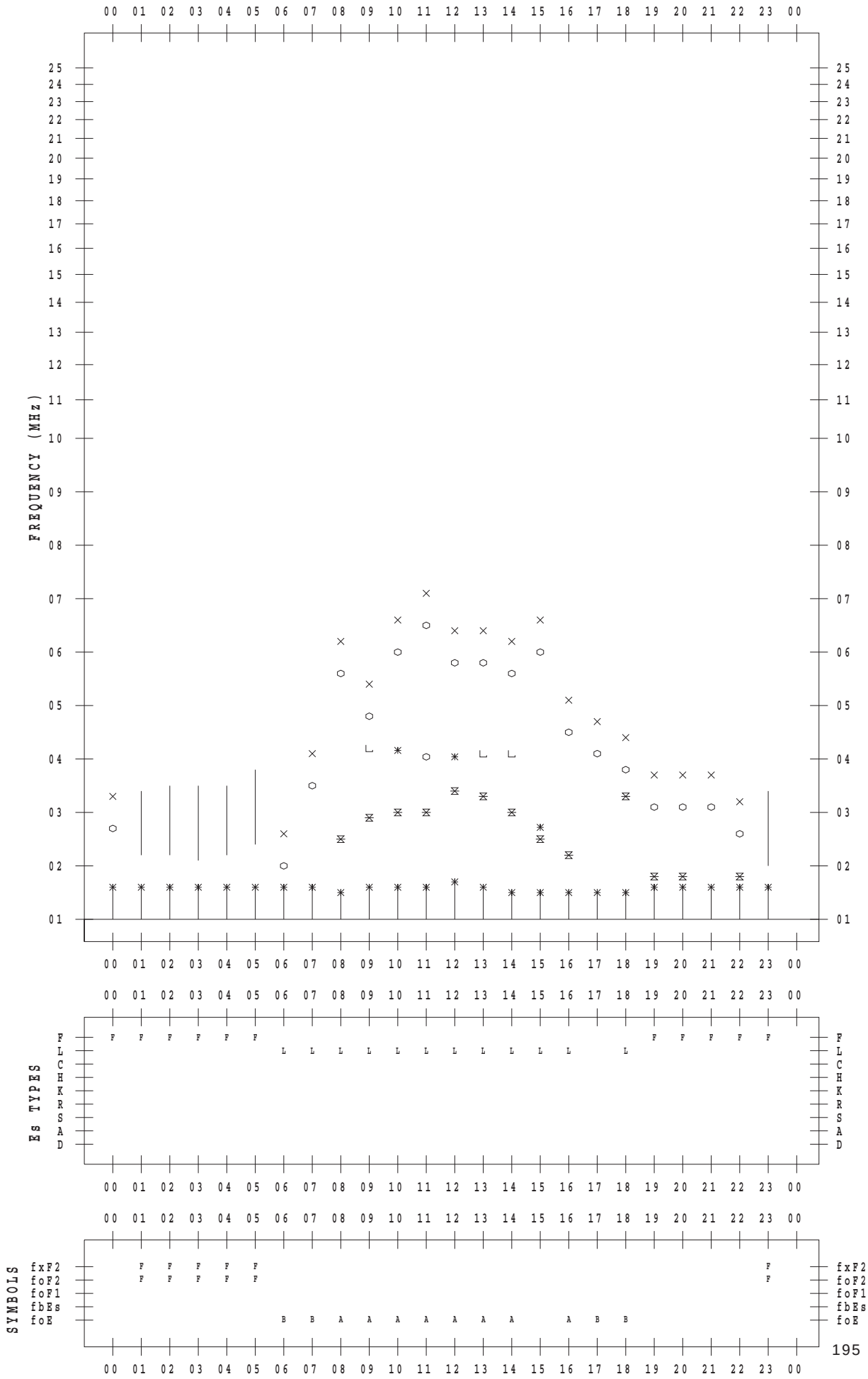
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018/11/28

135 °E MEAN TIME



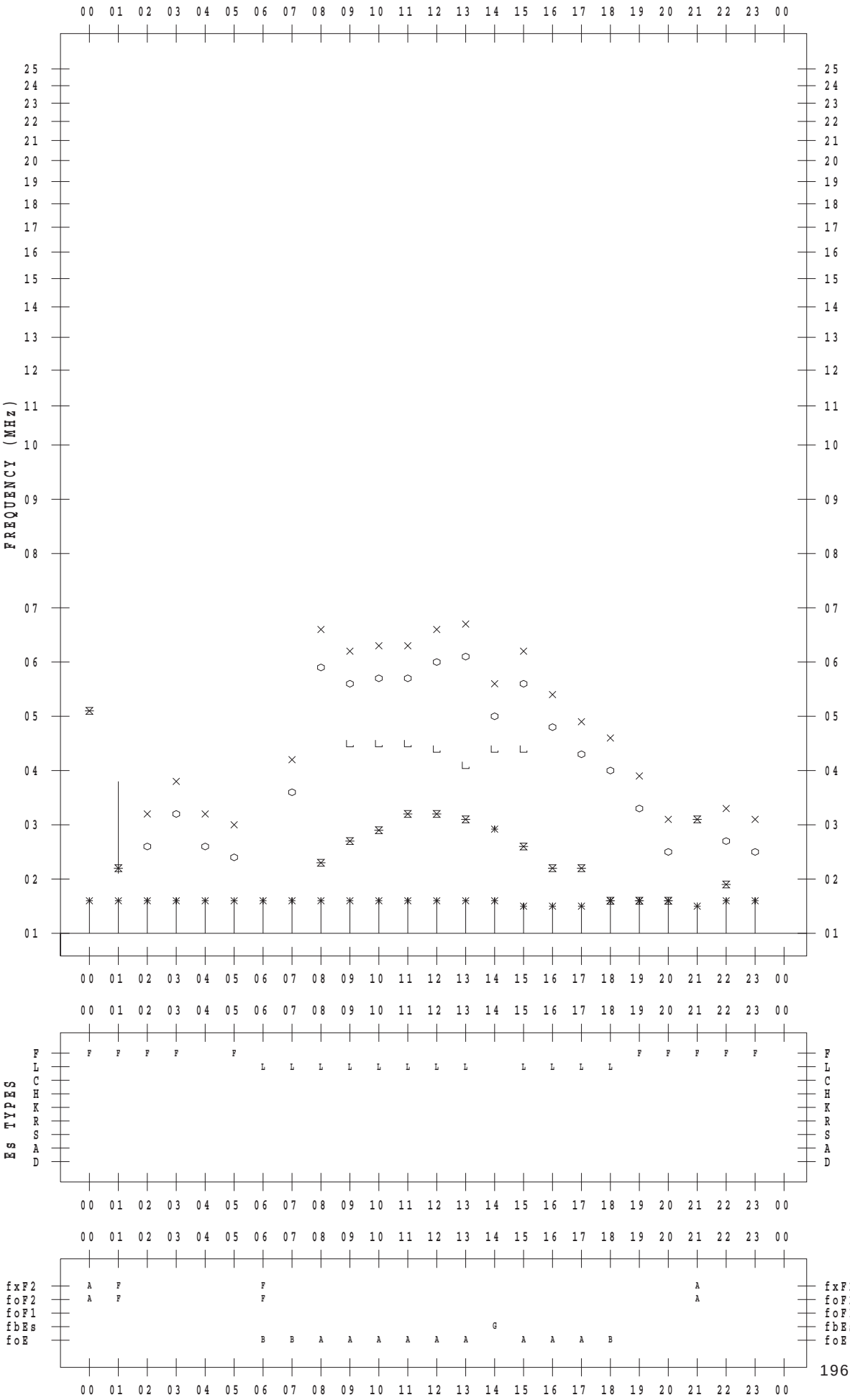
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018/11/29

135 °E MEAN TIME



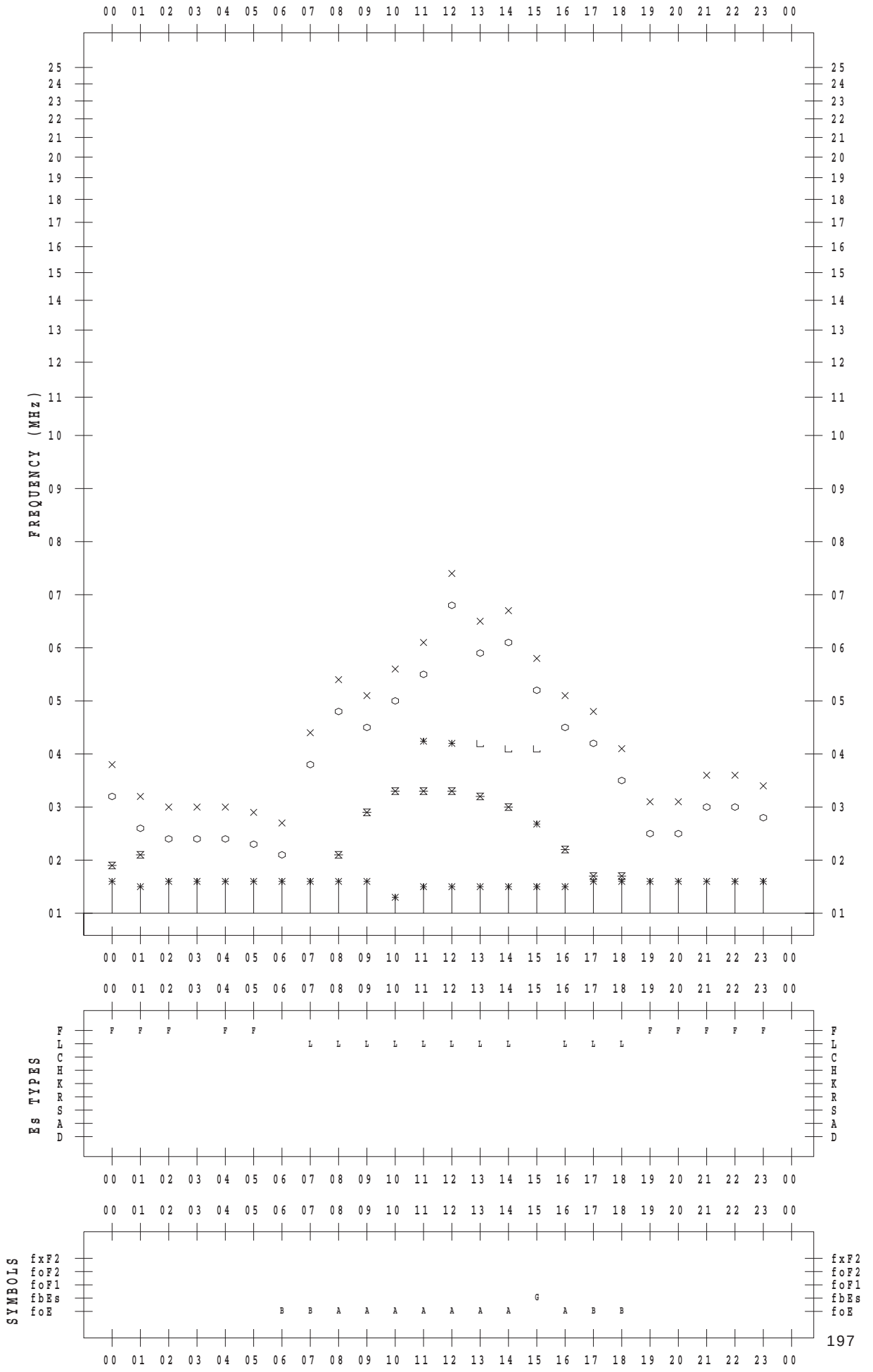
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Yamagawa

DATE : 2018/11/30

135 °E MEAN TIME



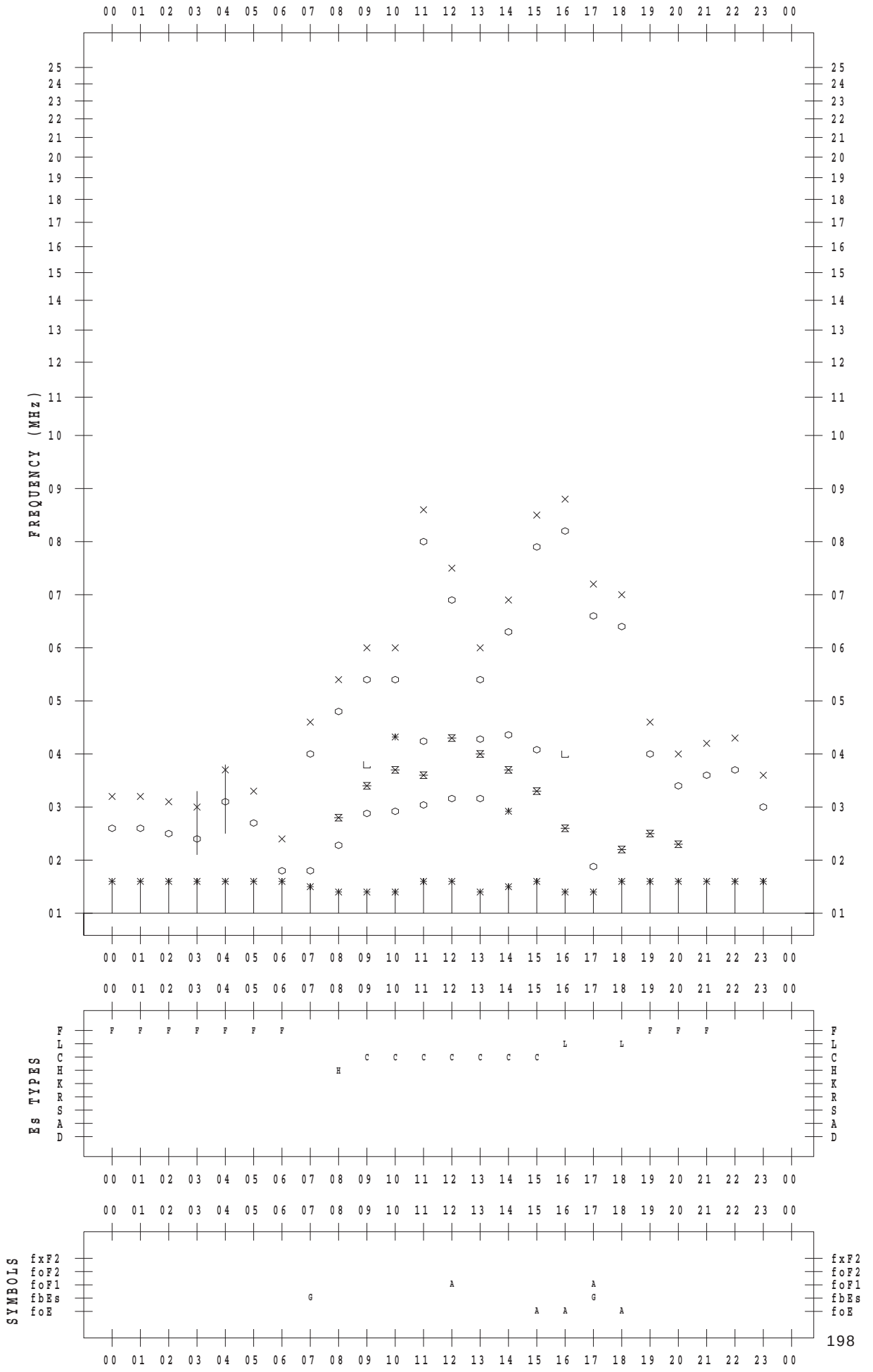
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018/11/ 1

135 °E MEAN TIME



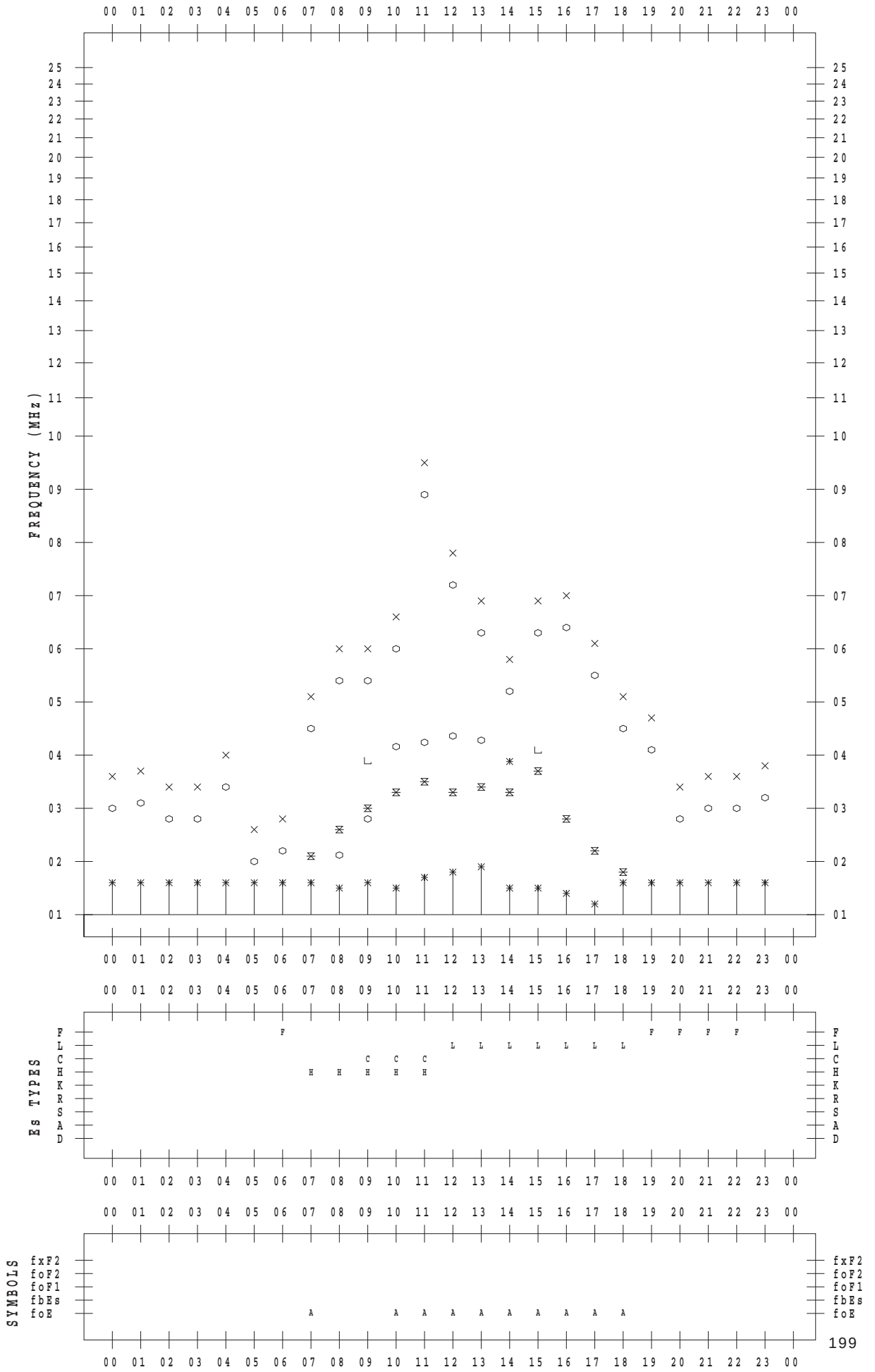
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018/11/ 2

135 °E MEAN TIME



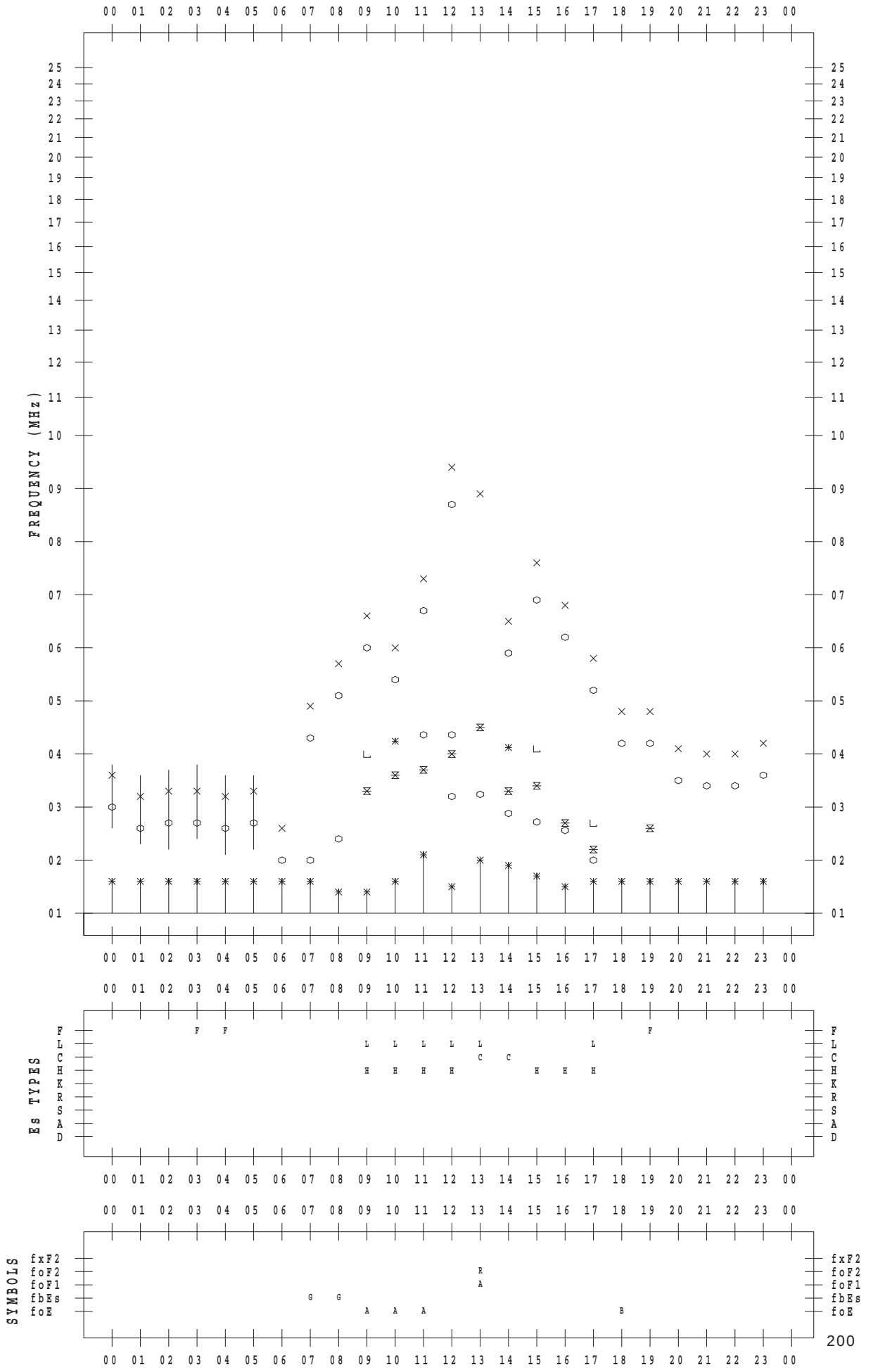
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018/11/ 3

135 °E MEAN TIME



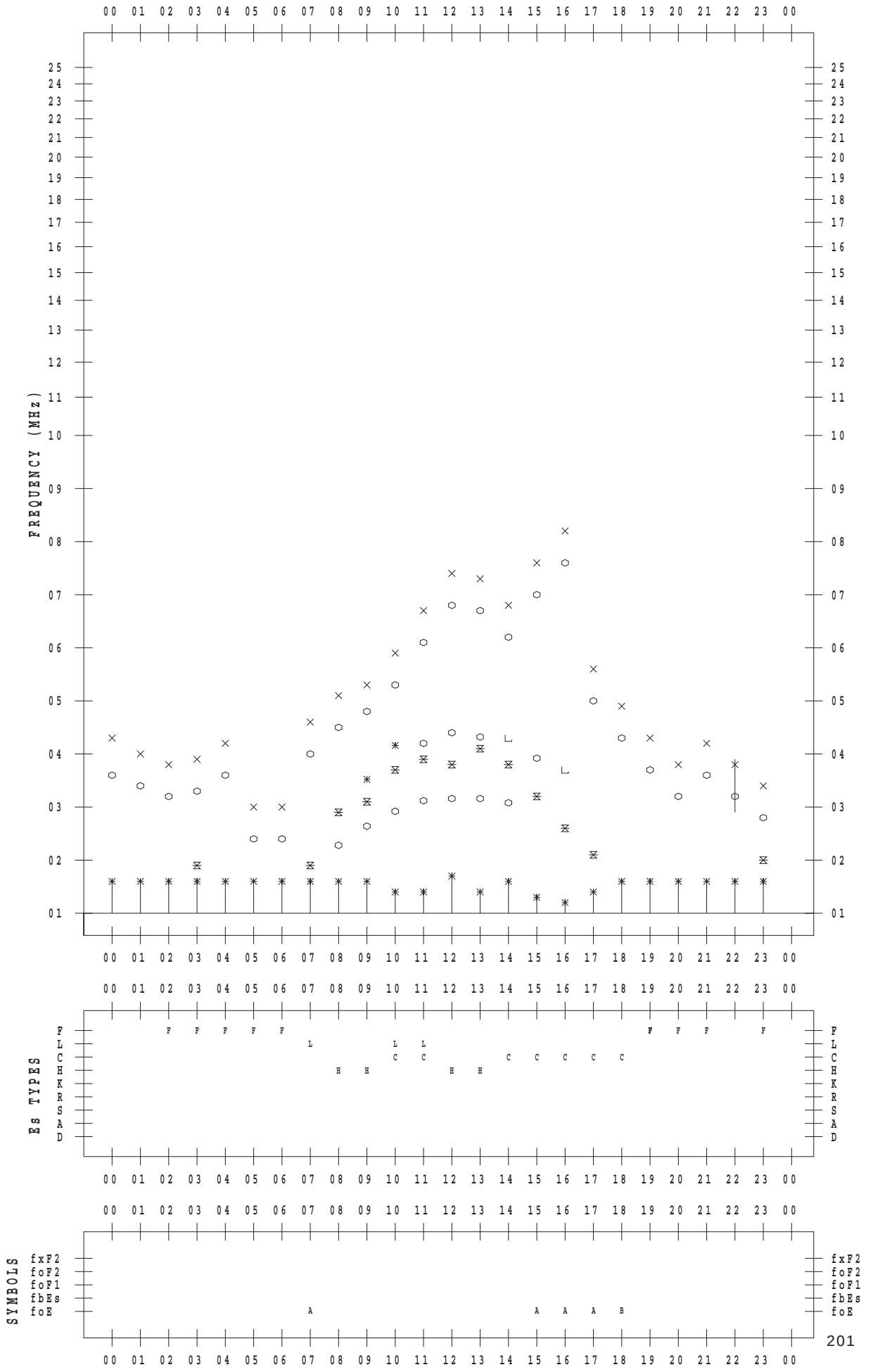
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018/11/ 4

135 °E MEAN TIME



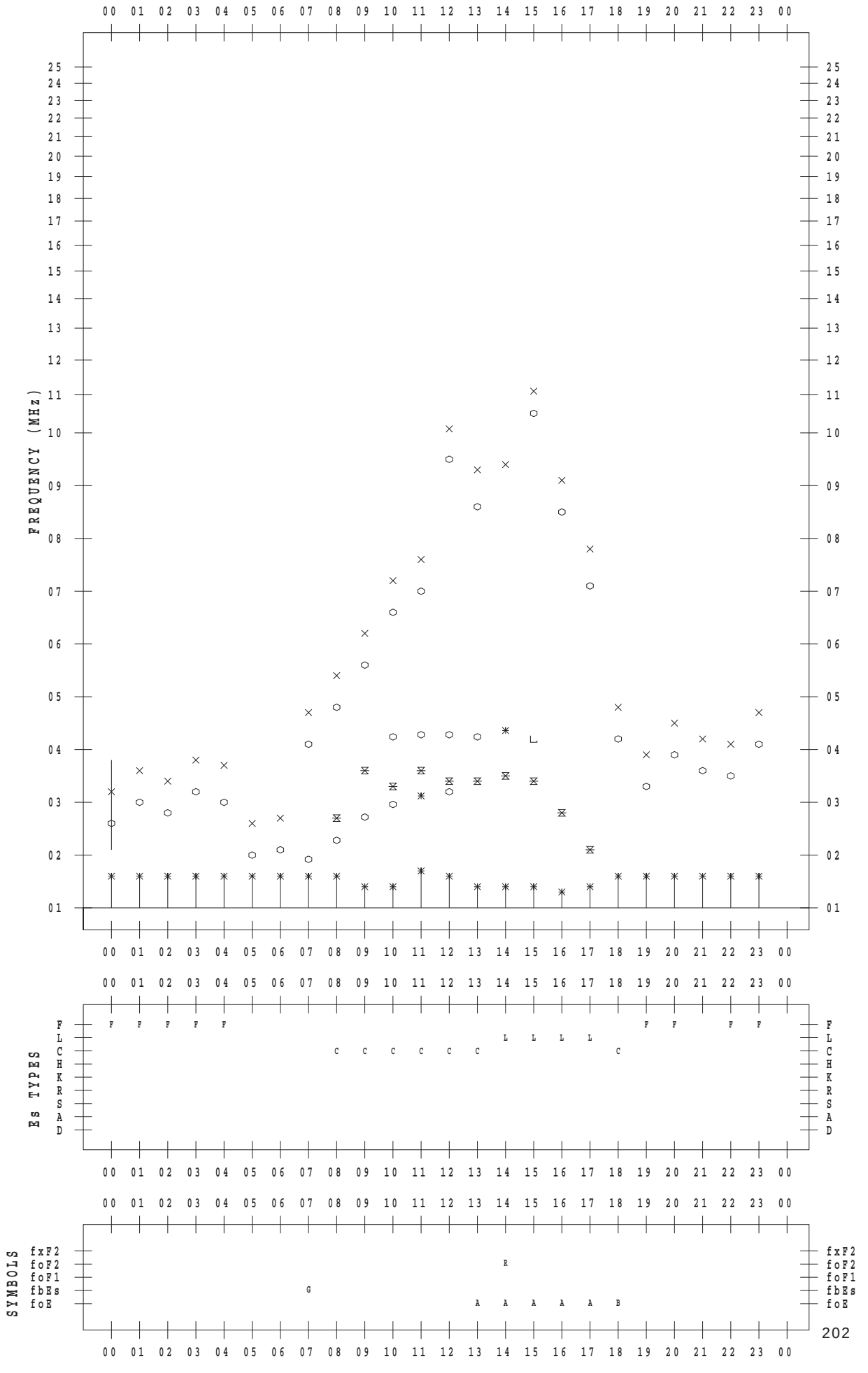
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018/11/ 5

135 °E MEAN TIME



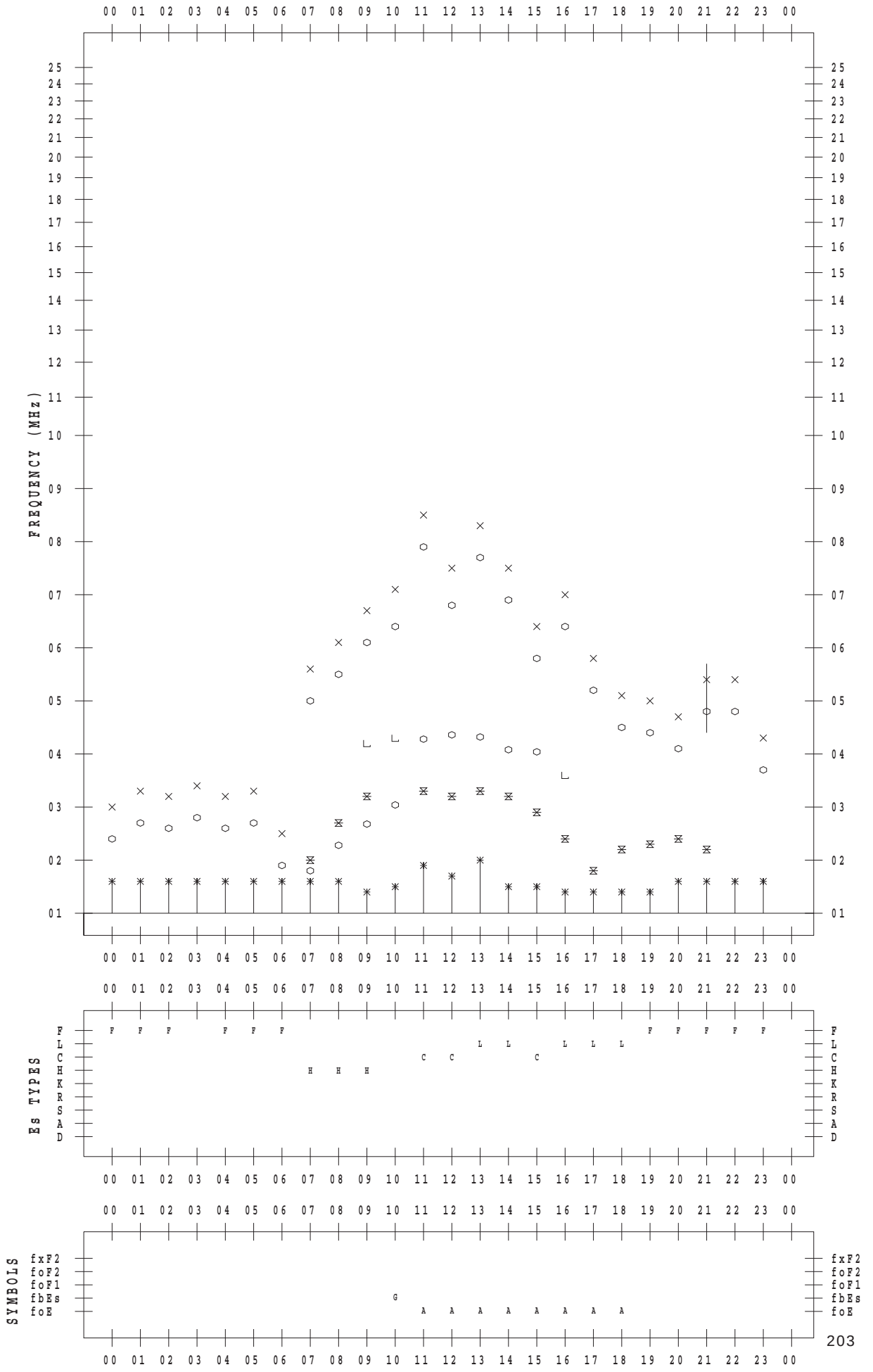
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018/11/ 6

135 °E MEAN TIME



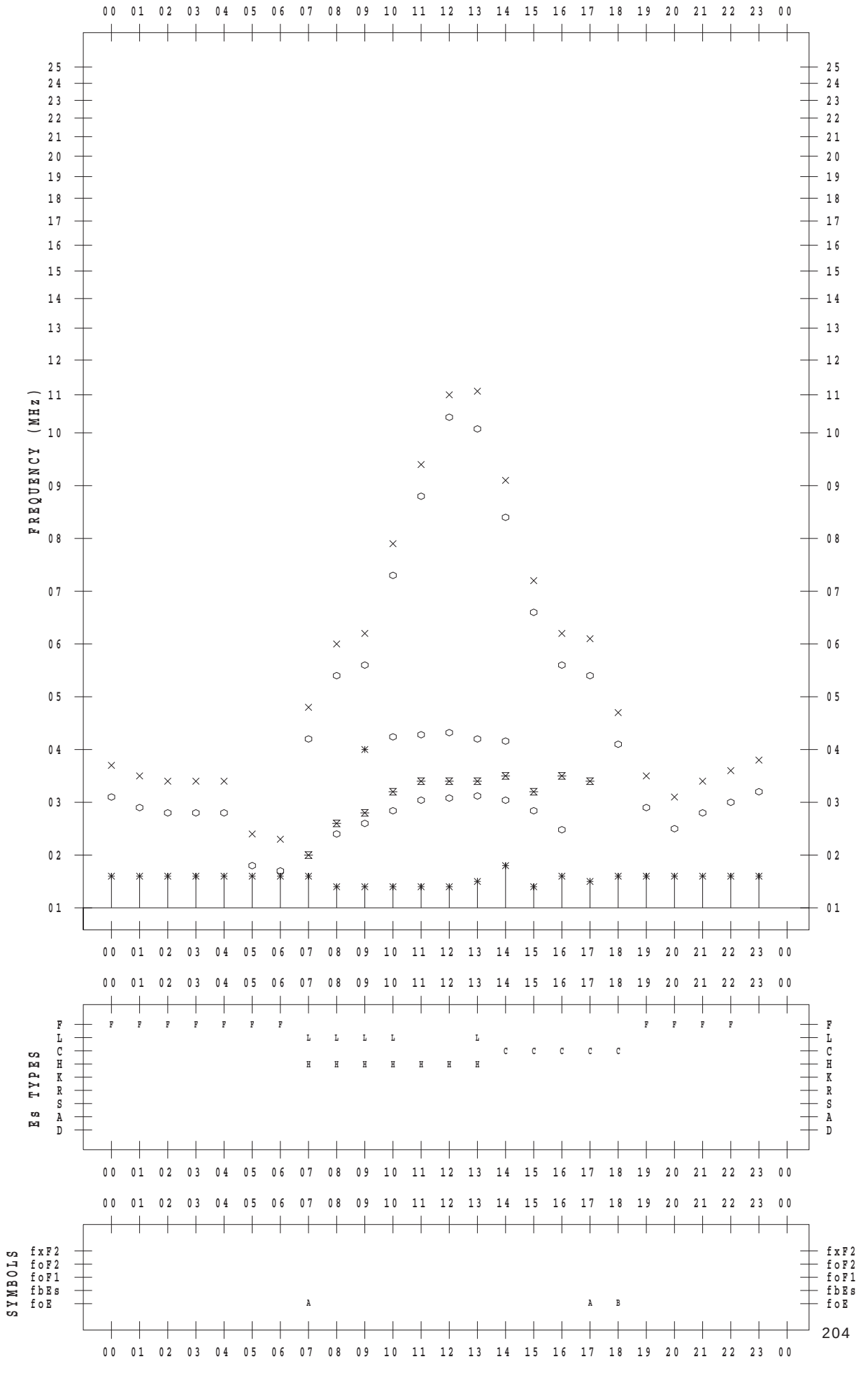
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018/11/ 7

135 °E MEAN TIME



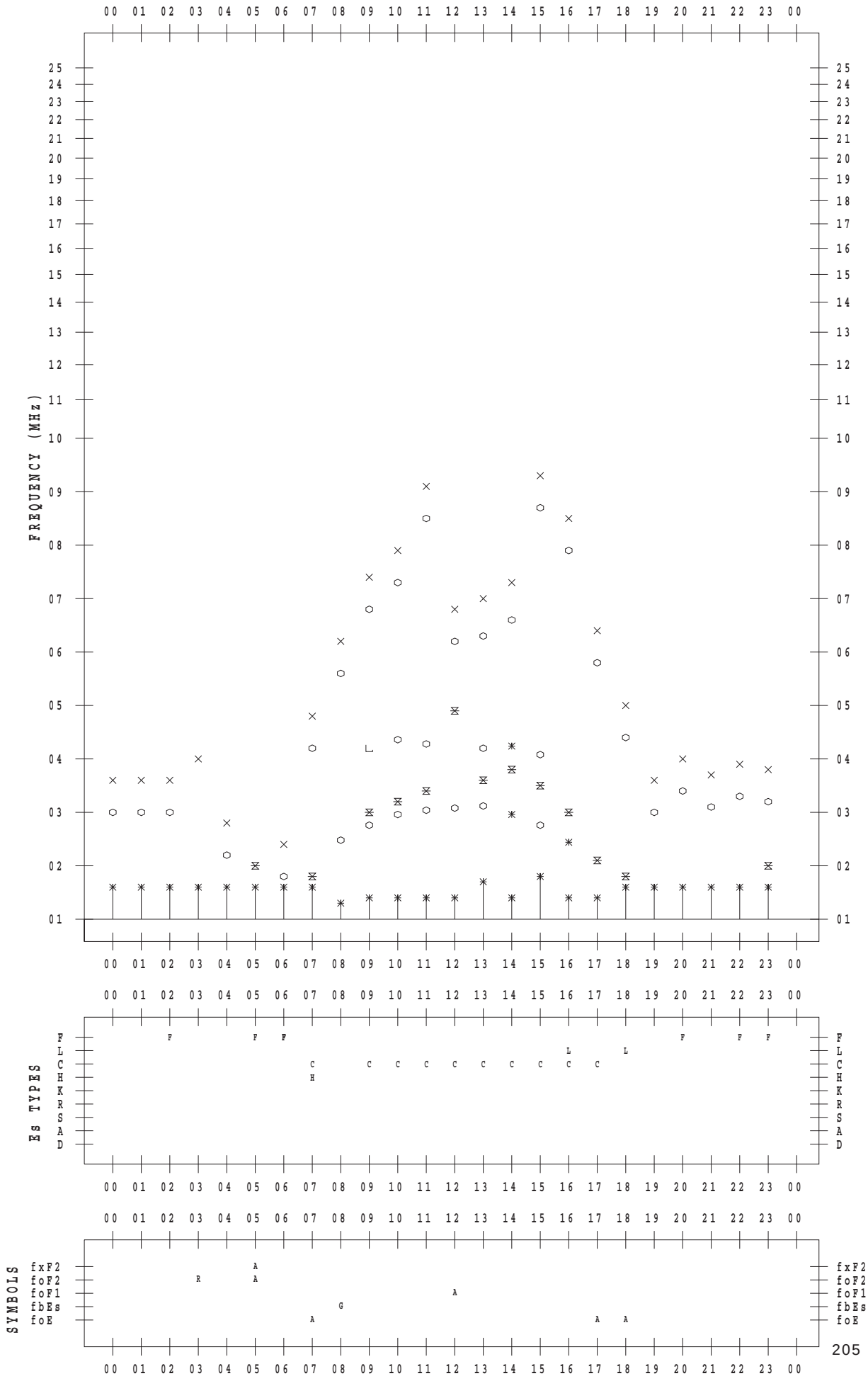
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018/11/ 8

135 °E MEAN TIME



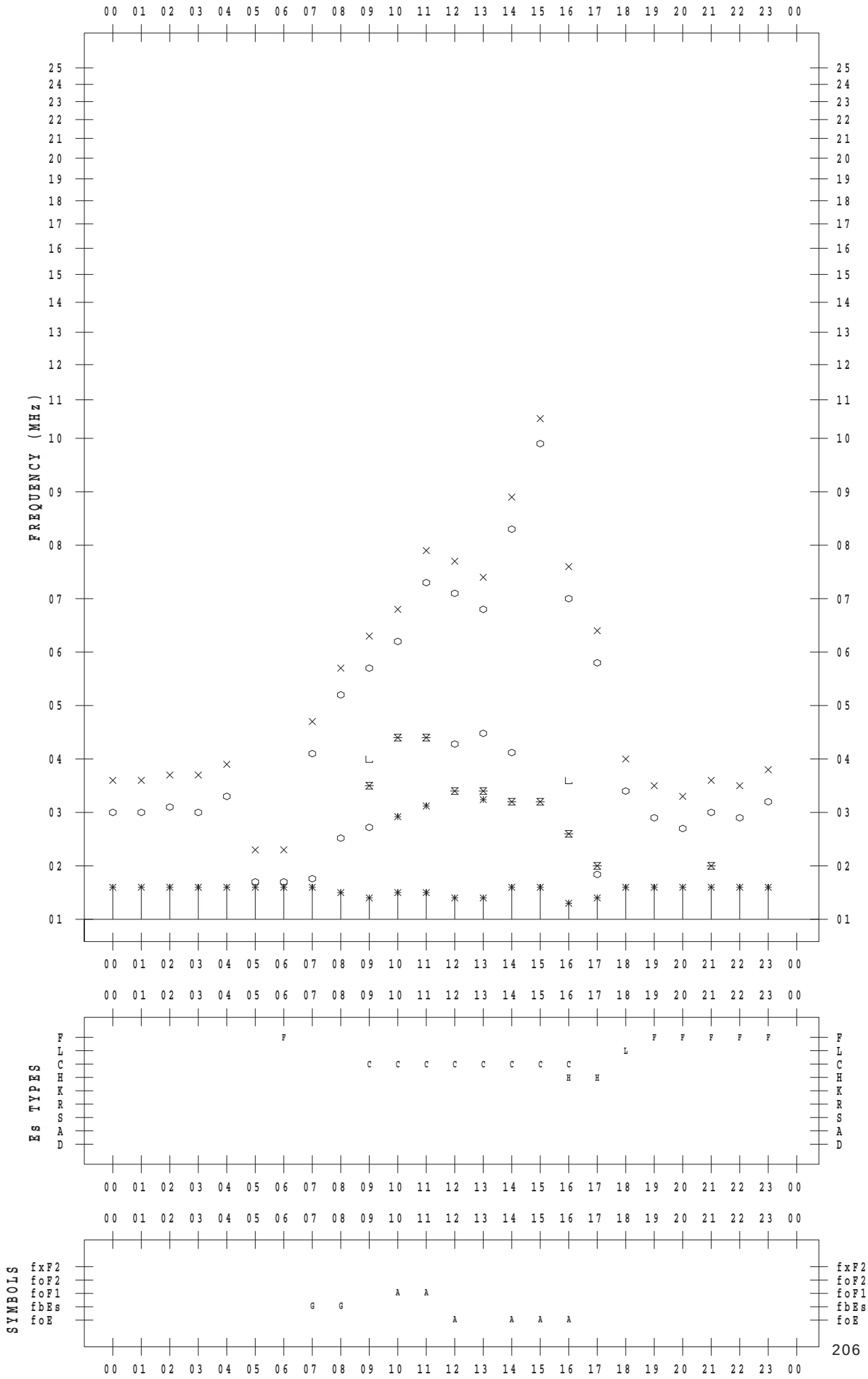
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018/11/ 9

135 °E MEAN TIME



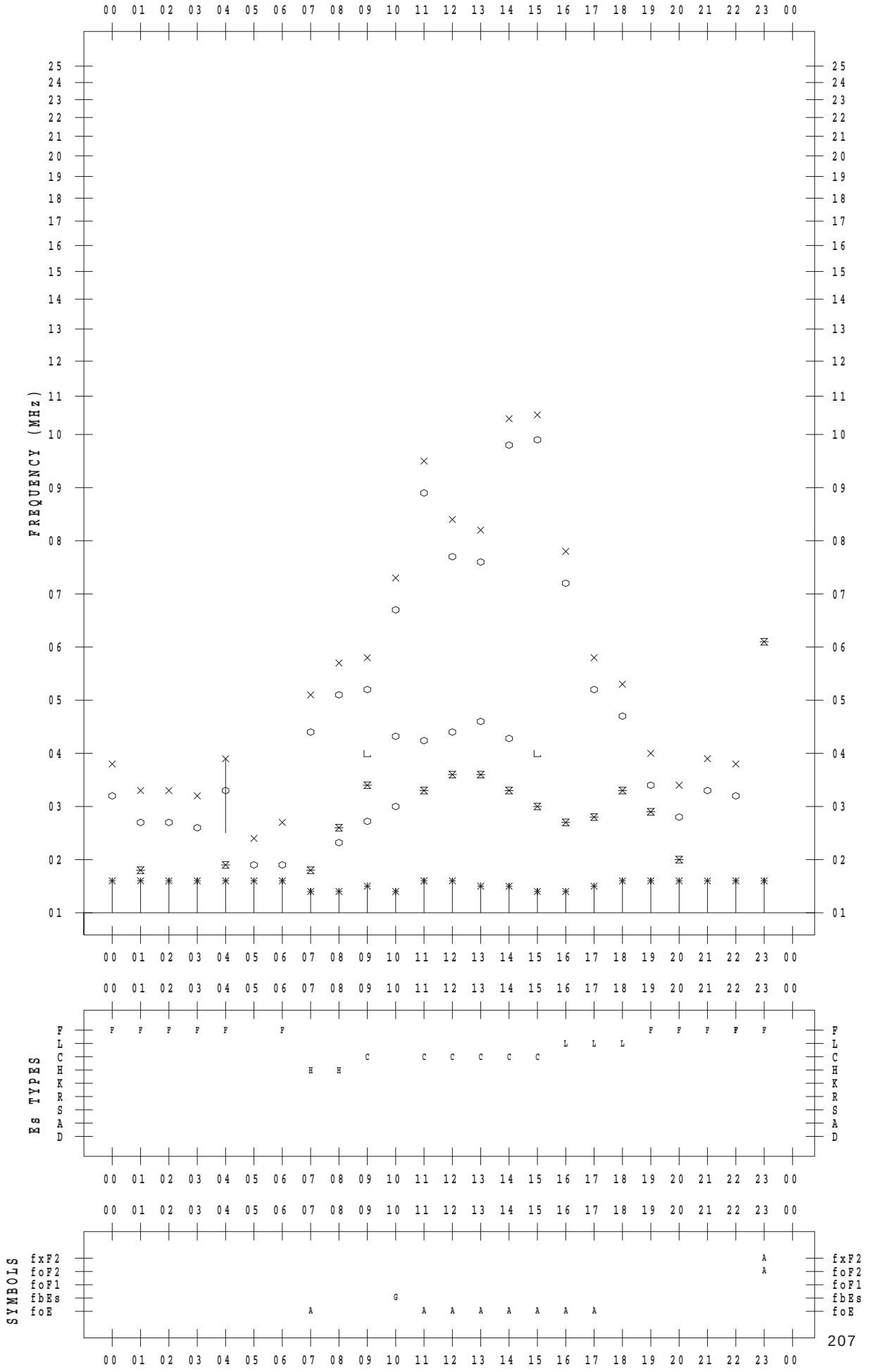
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018/11/10

135 °E MEAN TIME



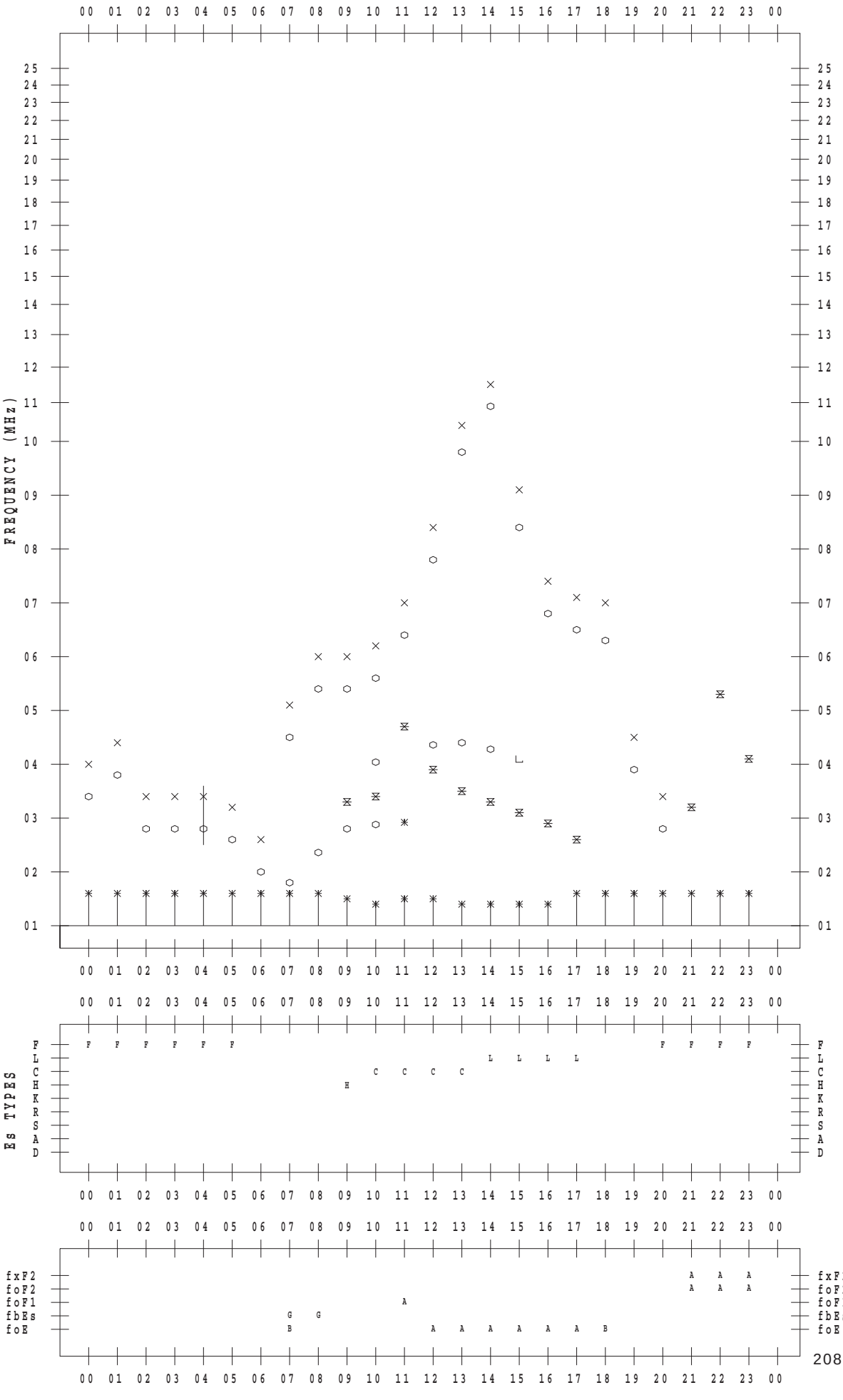
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018/11/11

135 °E MEAN TIME



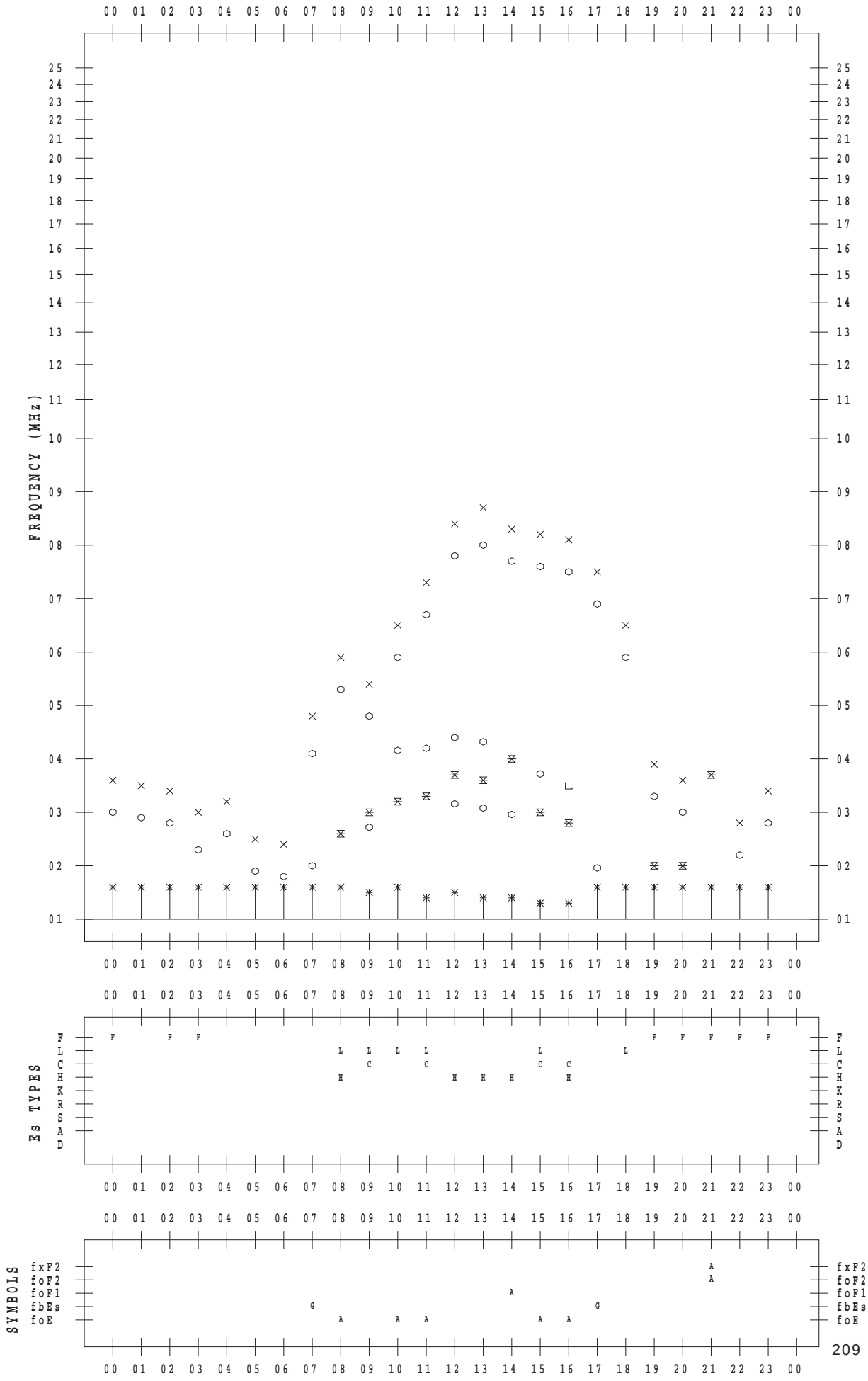
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018/11/12

135 °E MEAN TIME



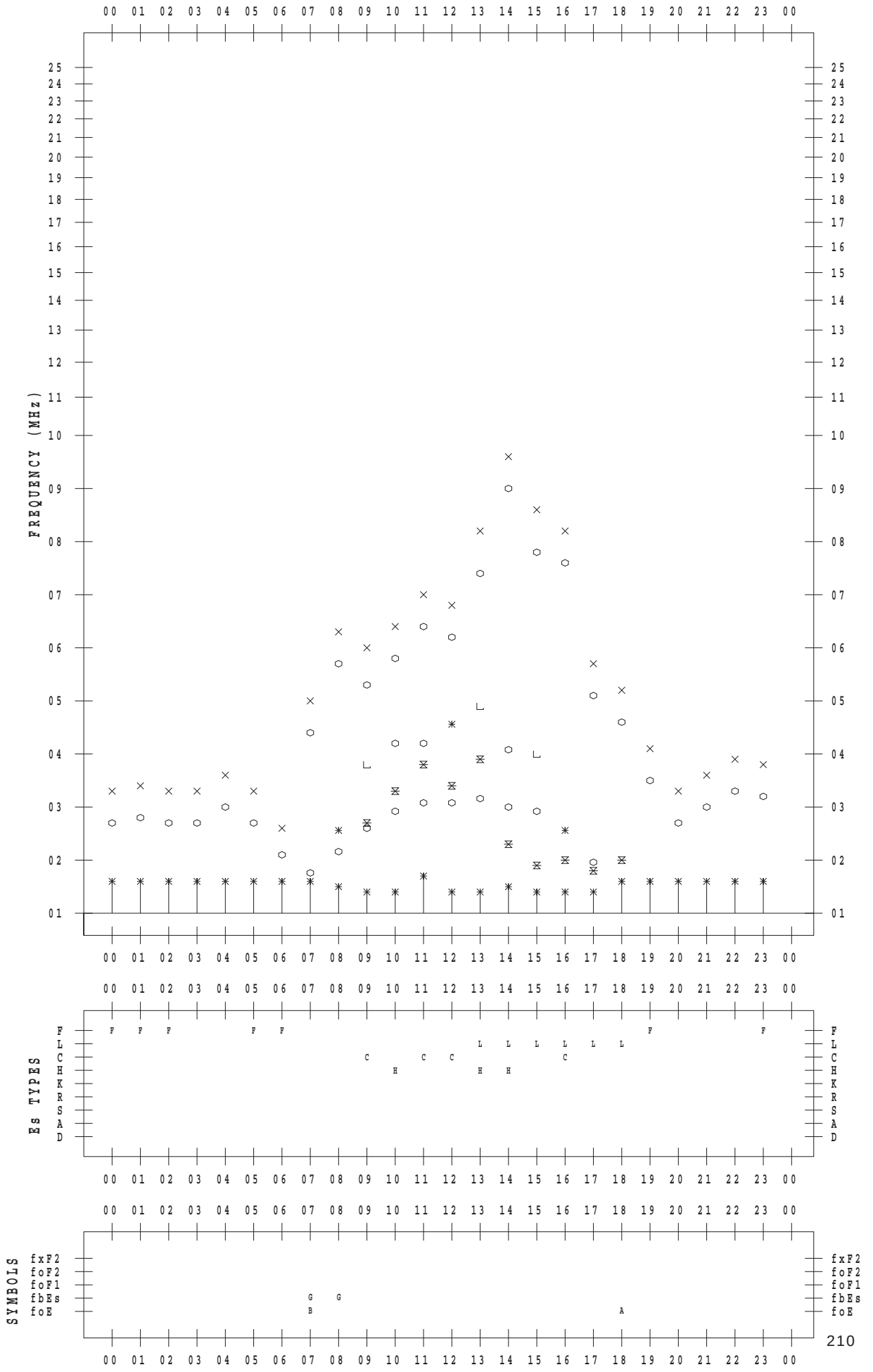
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018/11/13

135 °E MEAN TIME



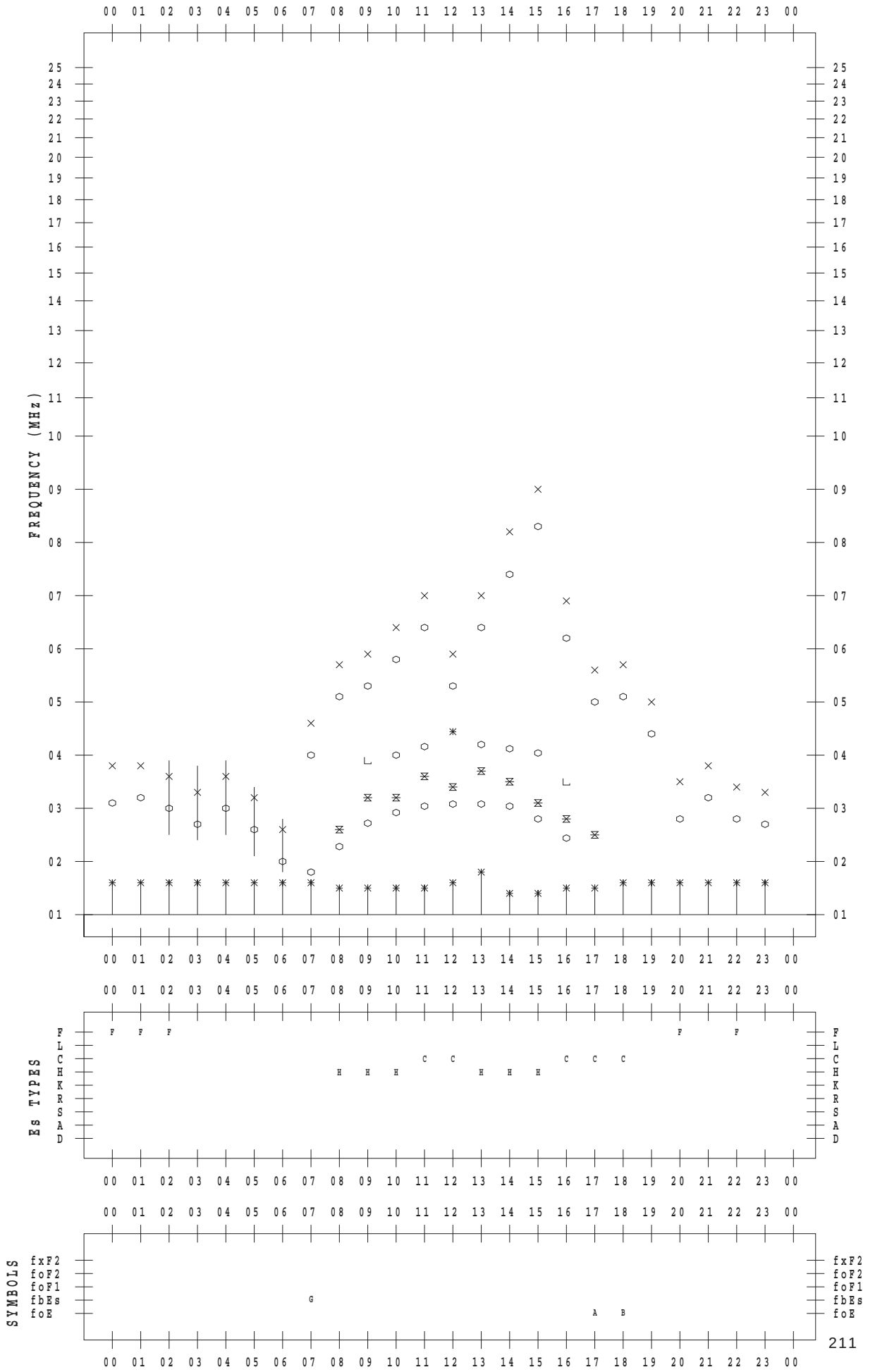
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018/11/14

135 °E MEAN TIME



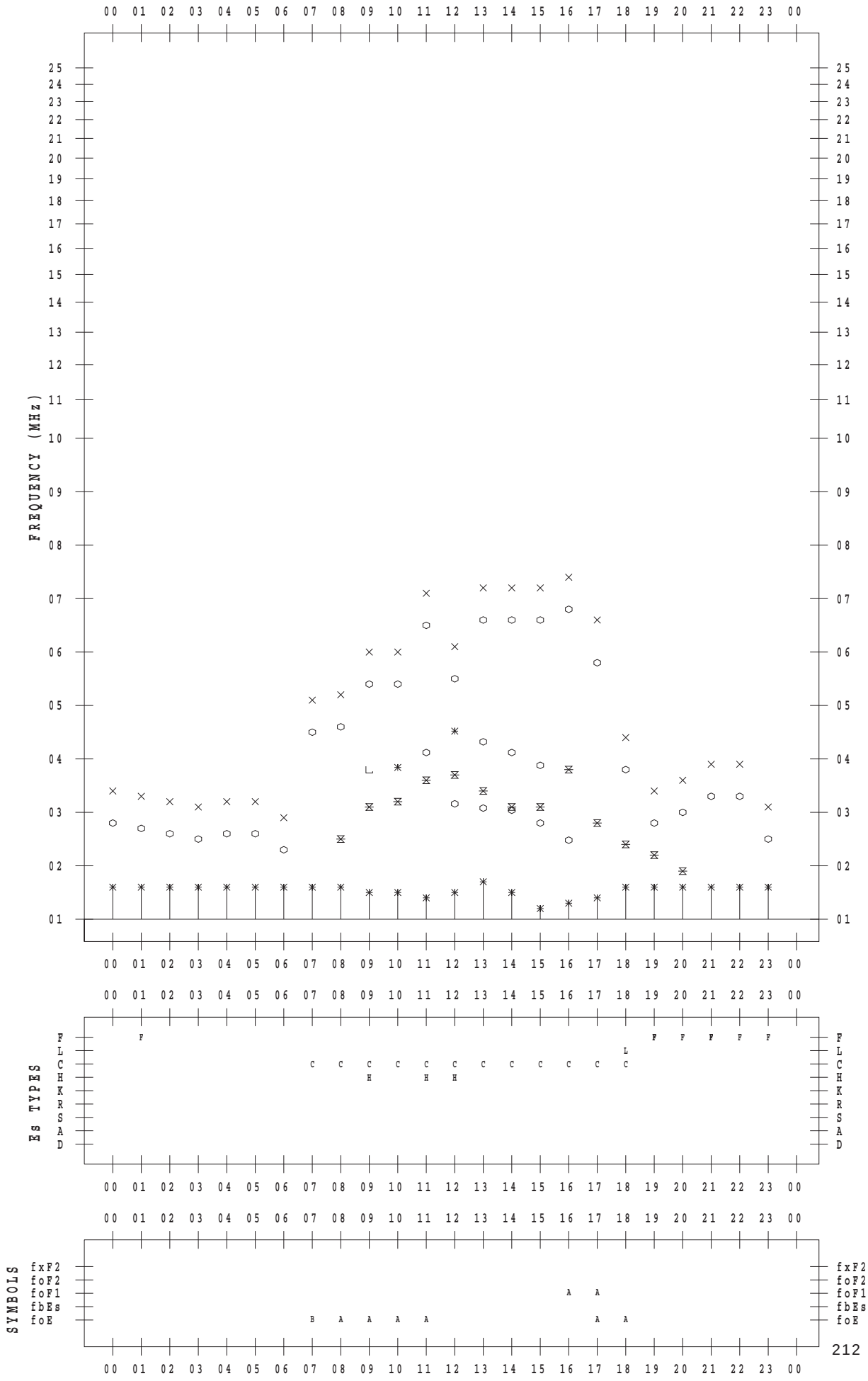
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018/11/15

135 °E MEAN TIME



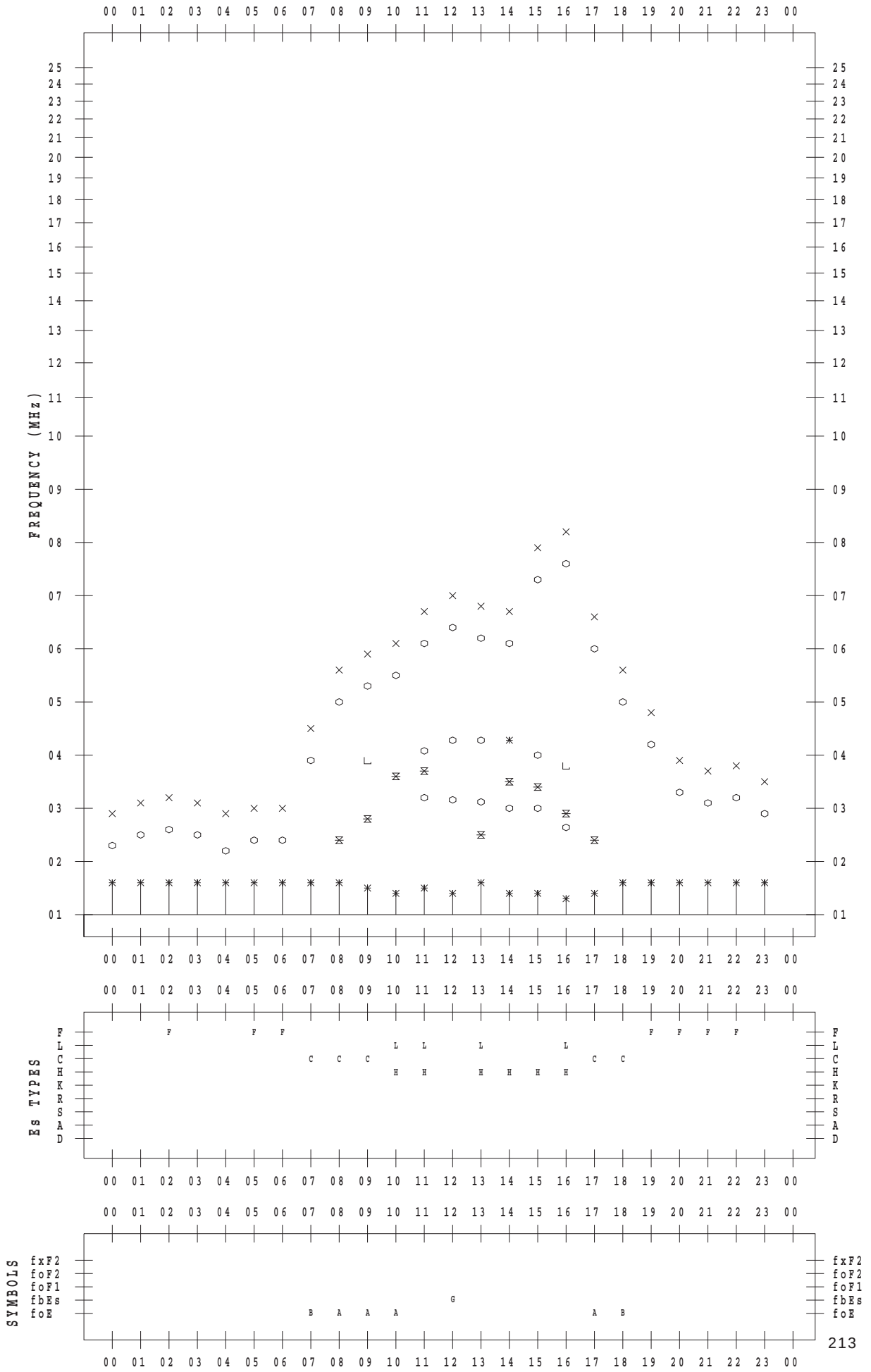
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018/11/16

135 °E MEAN TIME



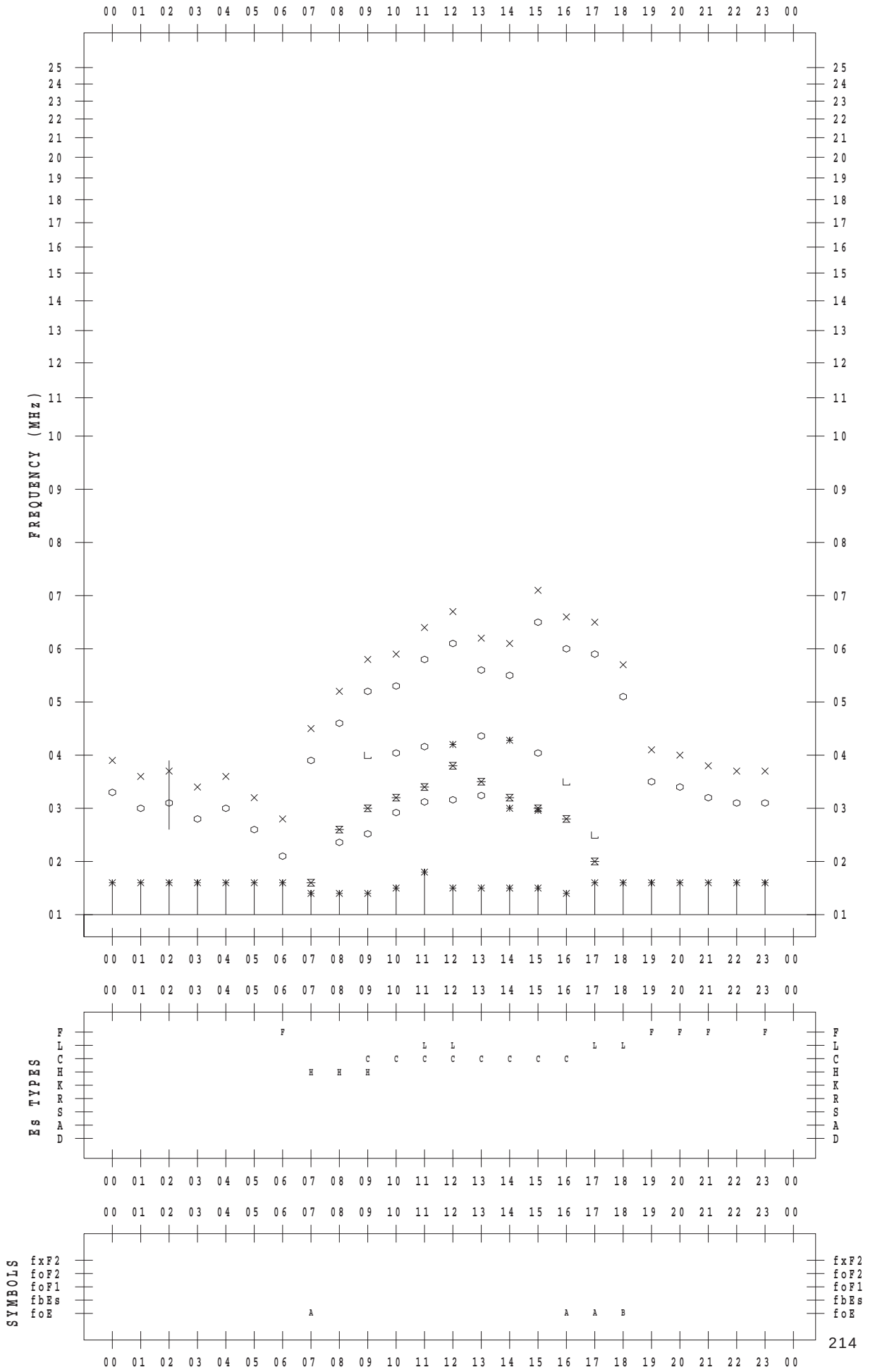
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018/11/17

135 °E MEAN TIME



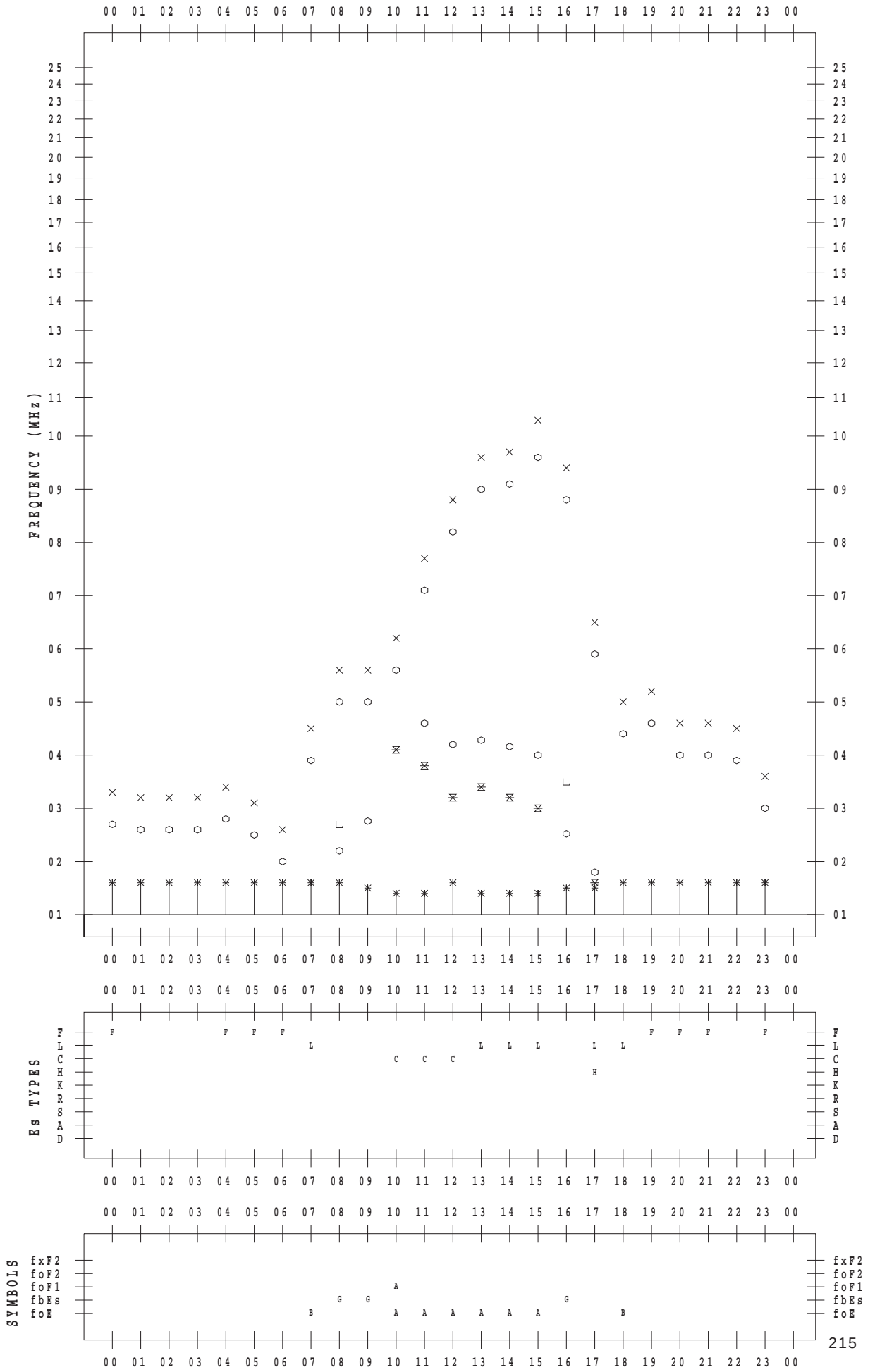
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018/11/18

135 °E MEAN TIME



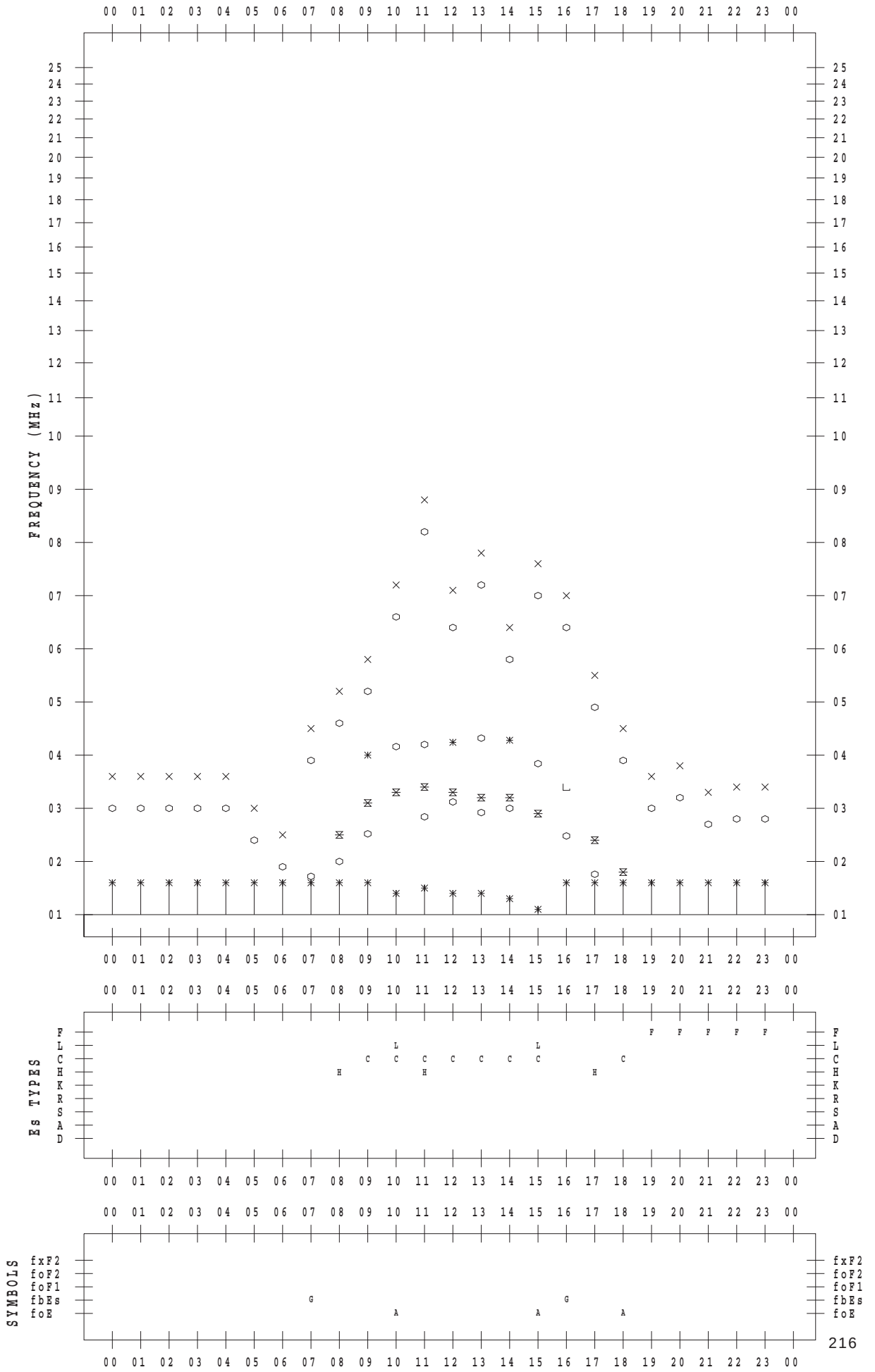
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018/11/19

135 °E MEAN TIME



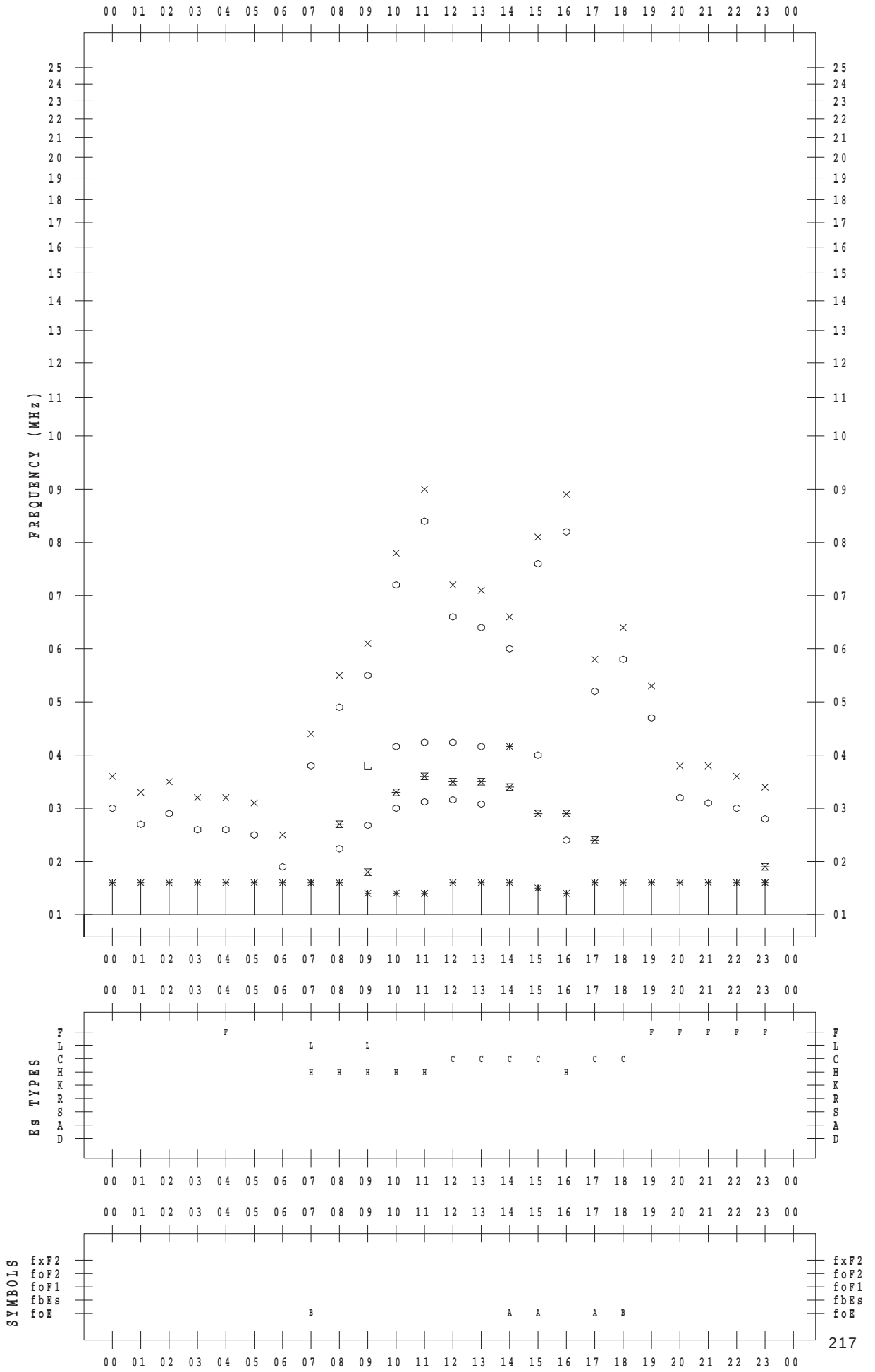
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018/11/20

135 °E MEAN TIME



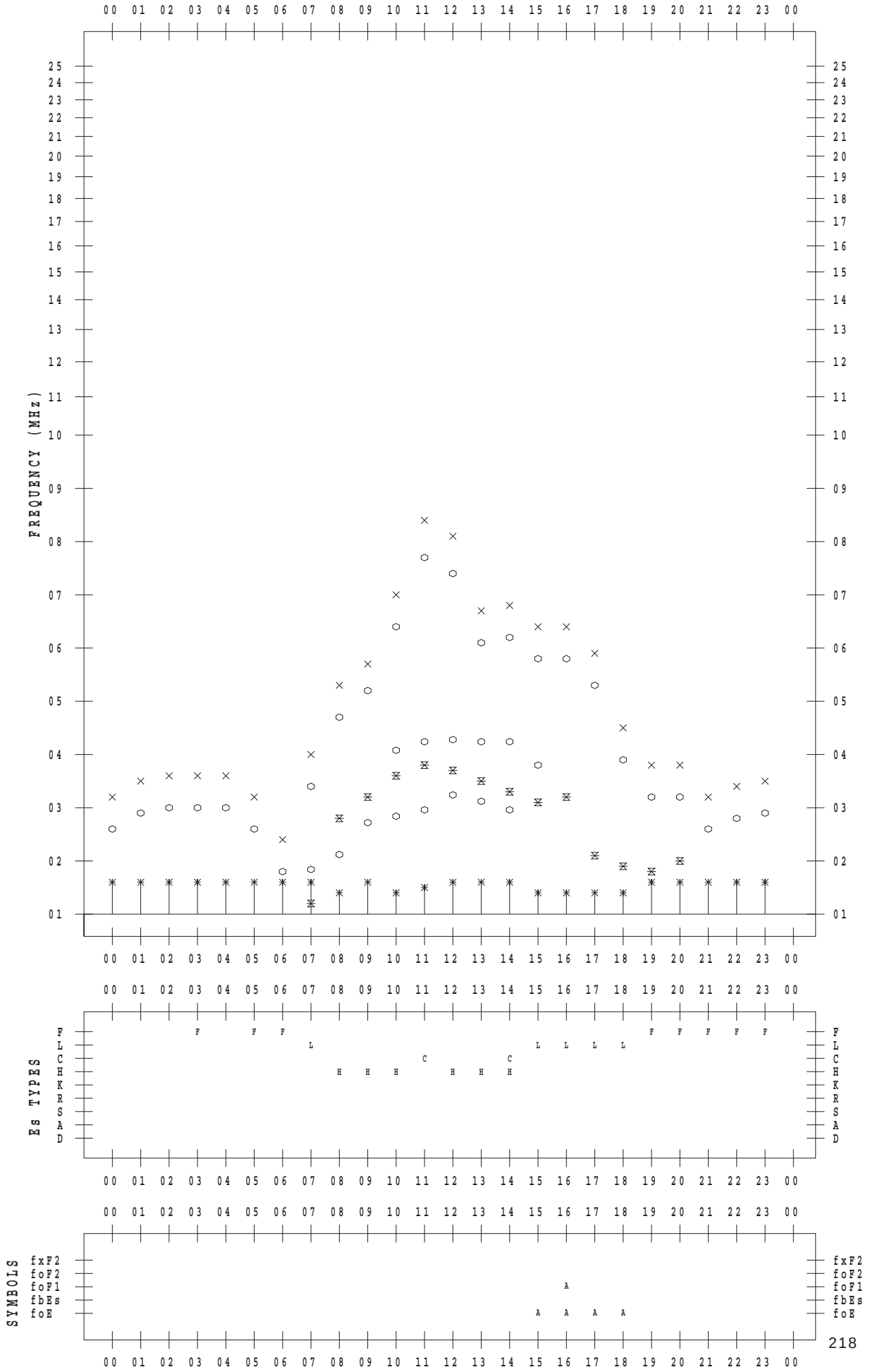
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018/11/21

135 °E MEAN TIME



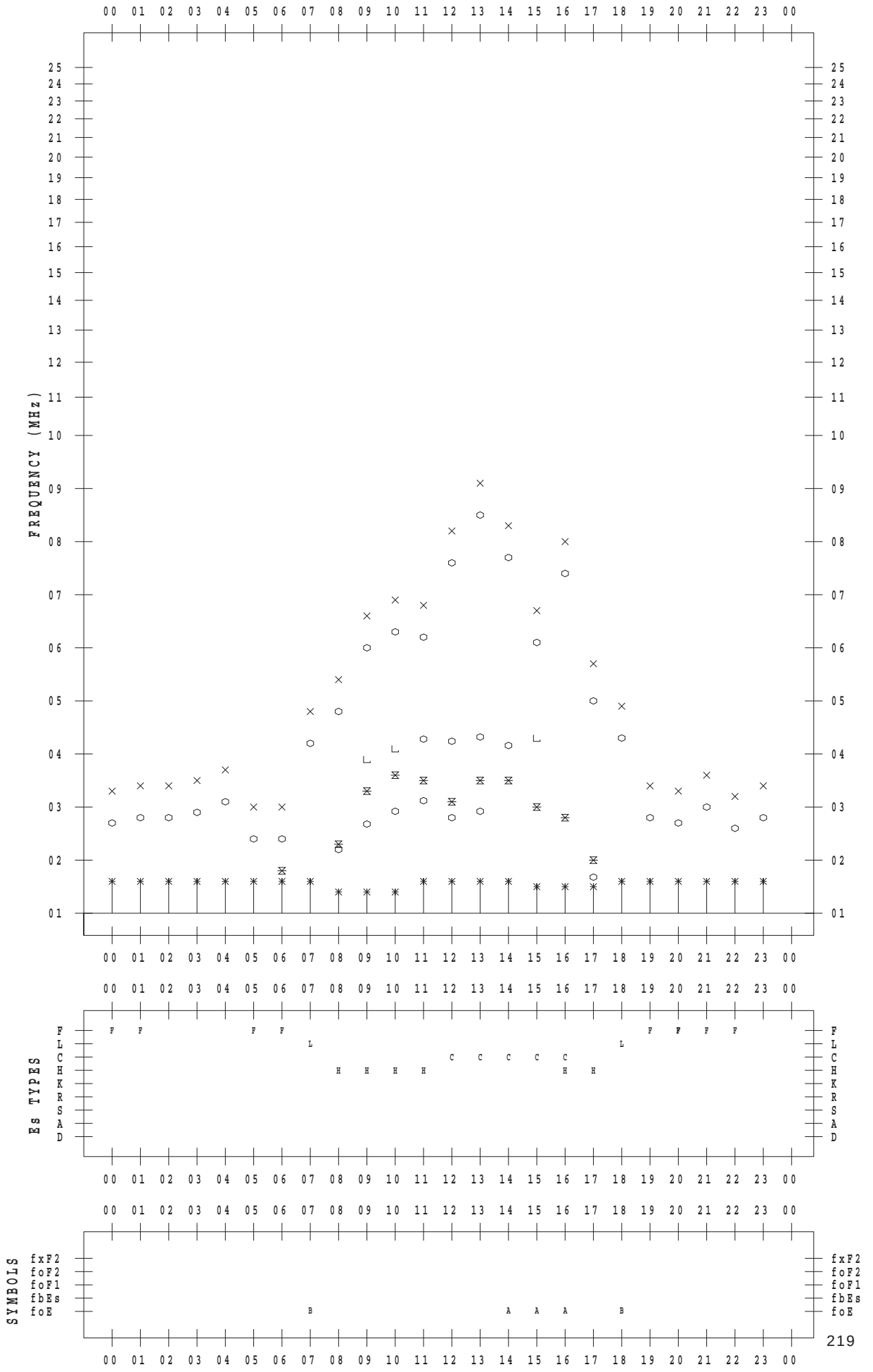
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018/11/22

135 °E MEAN TIME



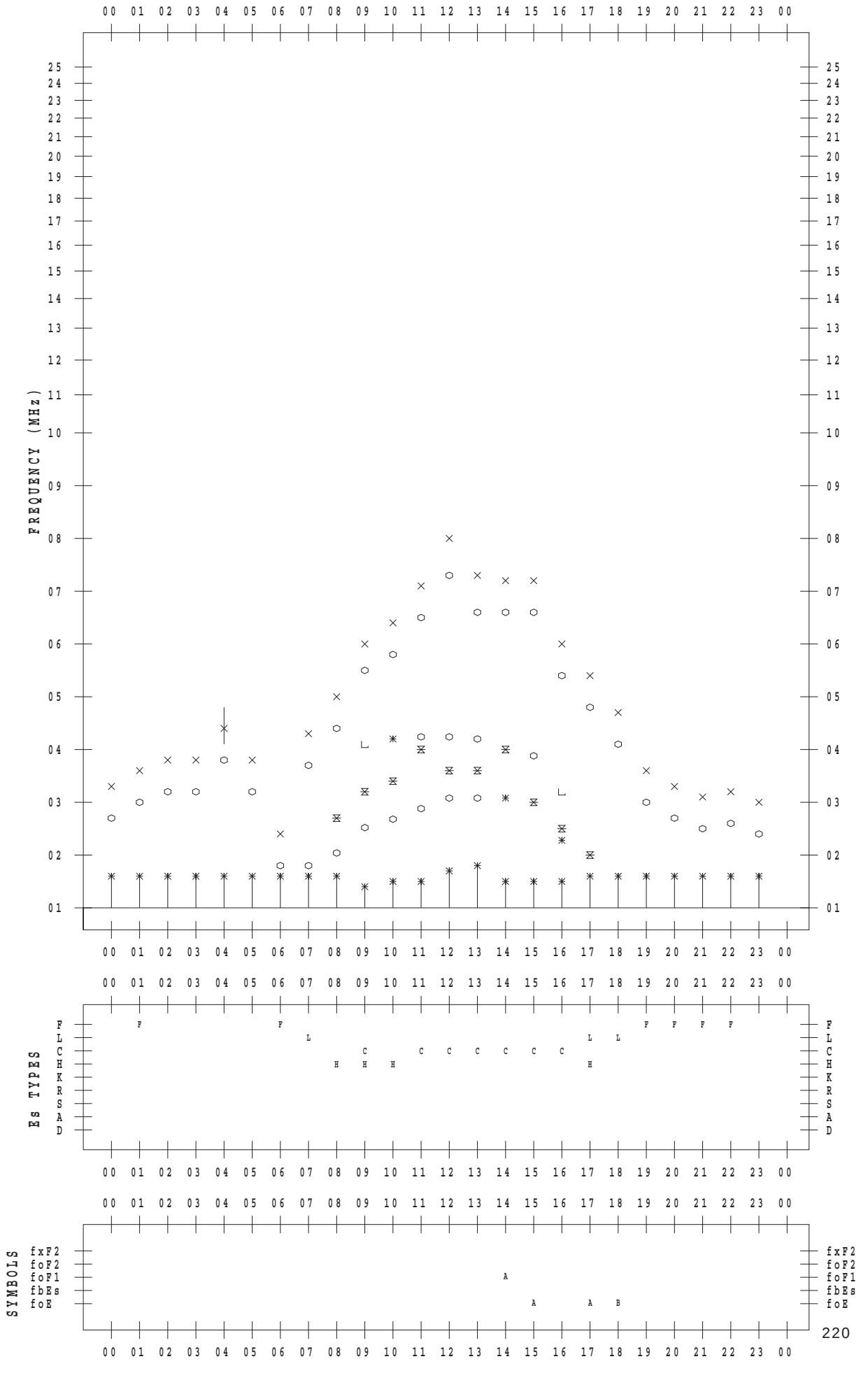
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018/11/23

135 °E MEAN TIME



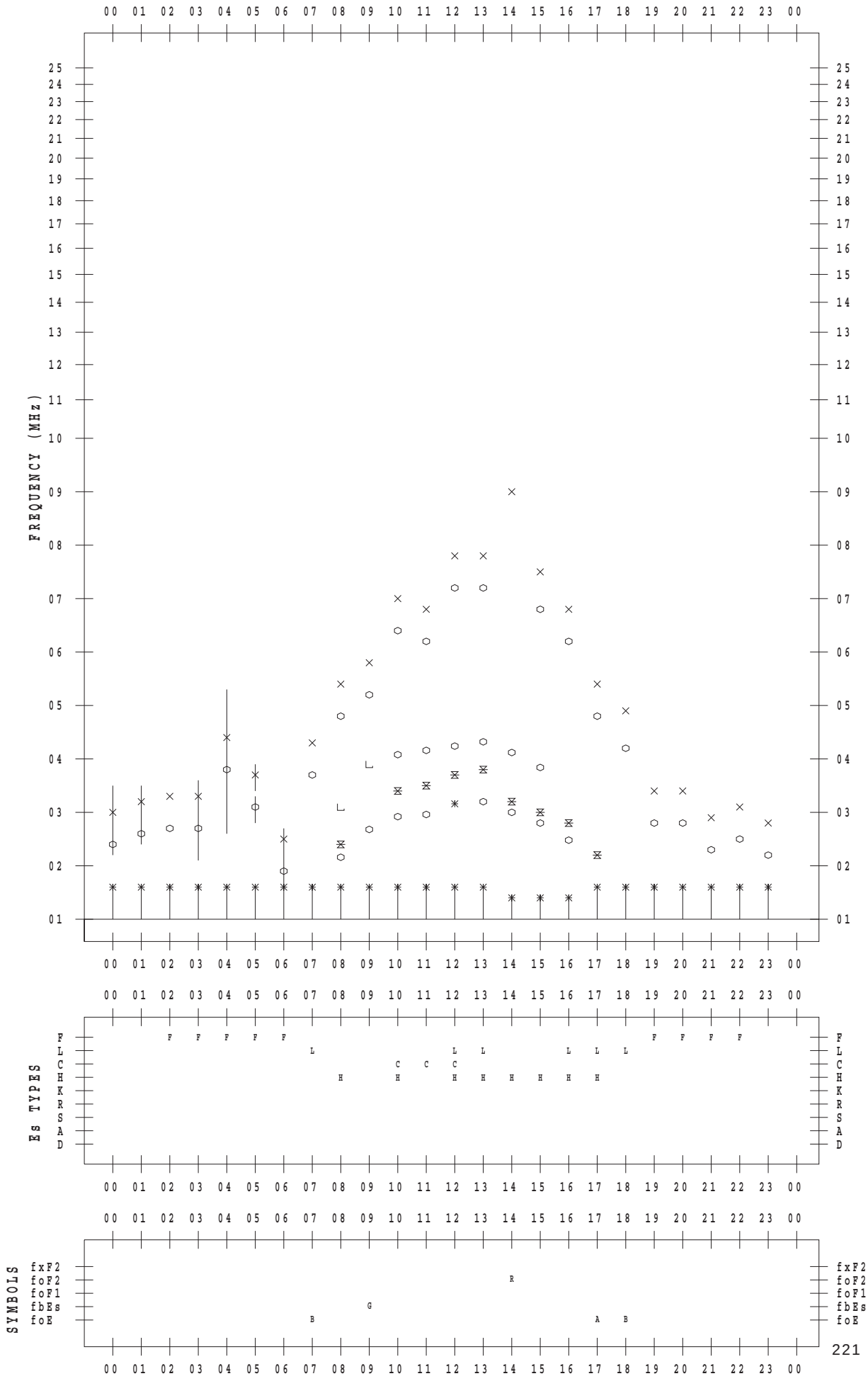
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018/11/24

135 °E MEAN TIME



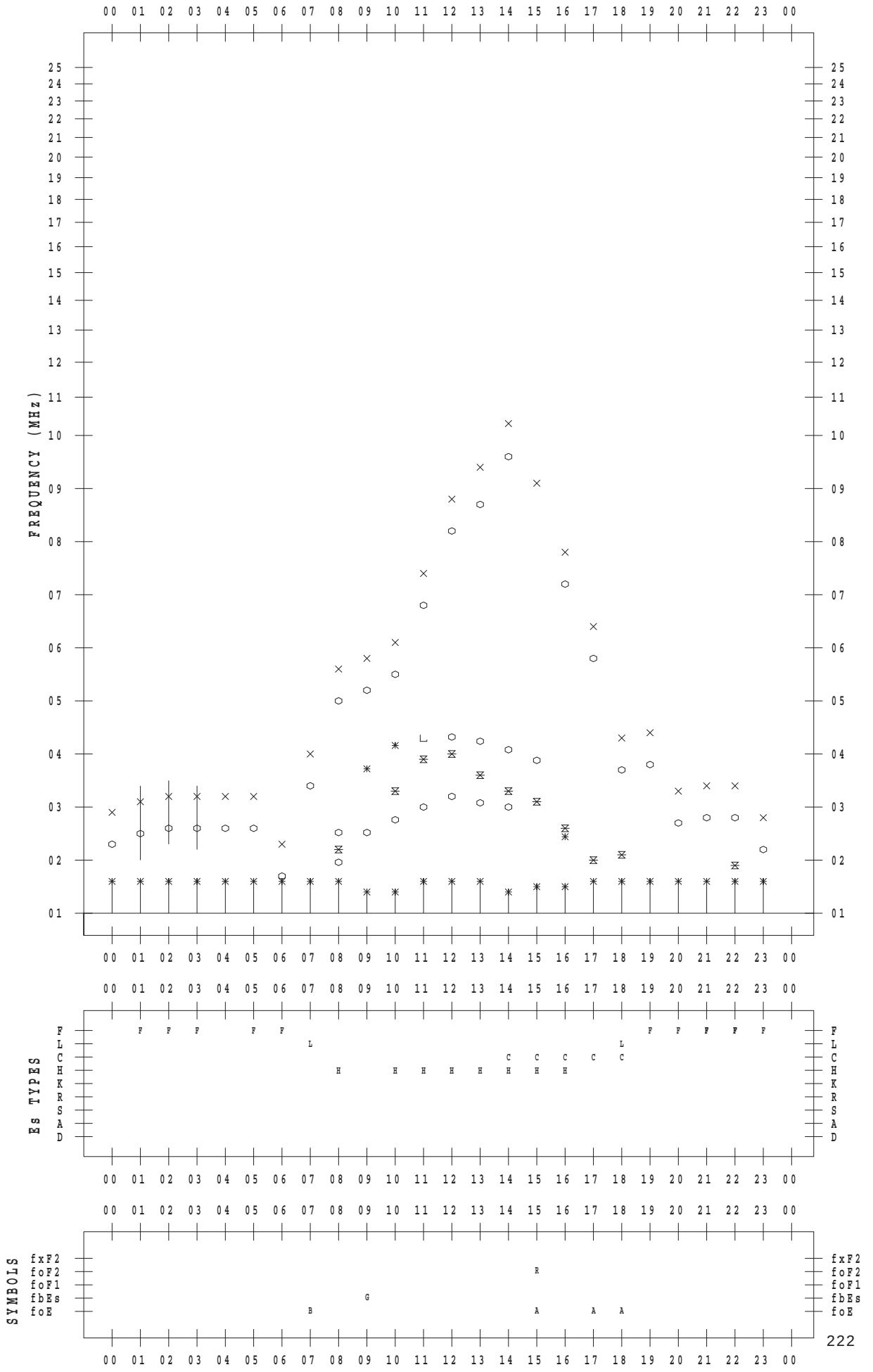
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018/11/25

135 °E MEAN TIME



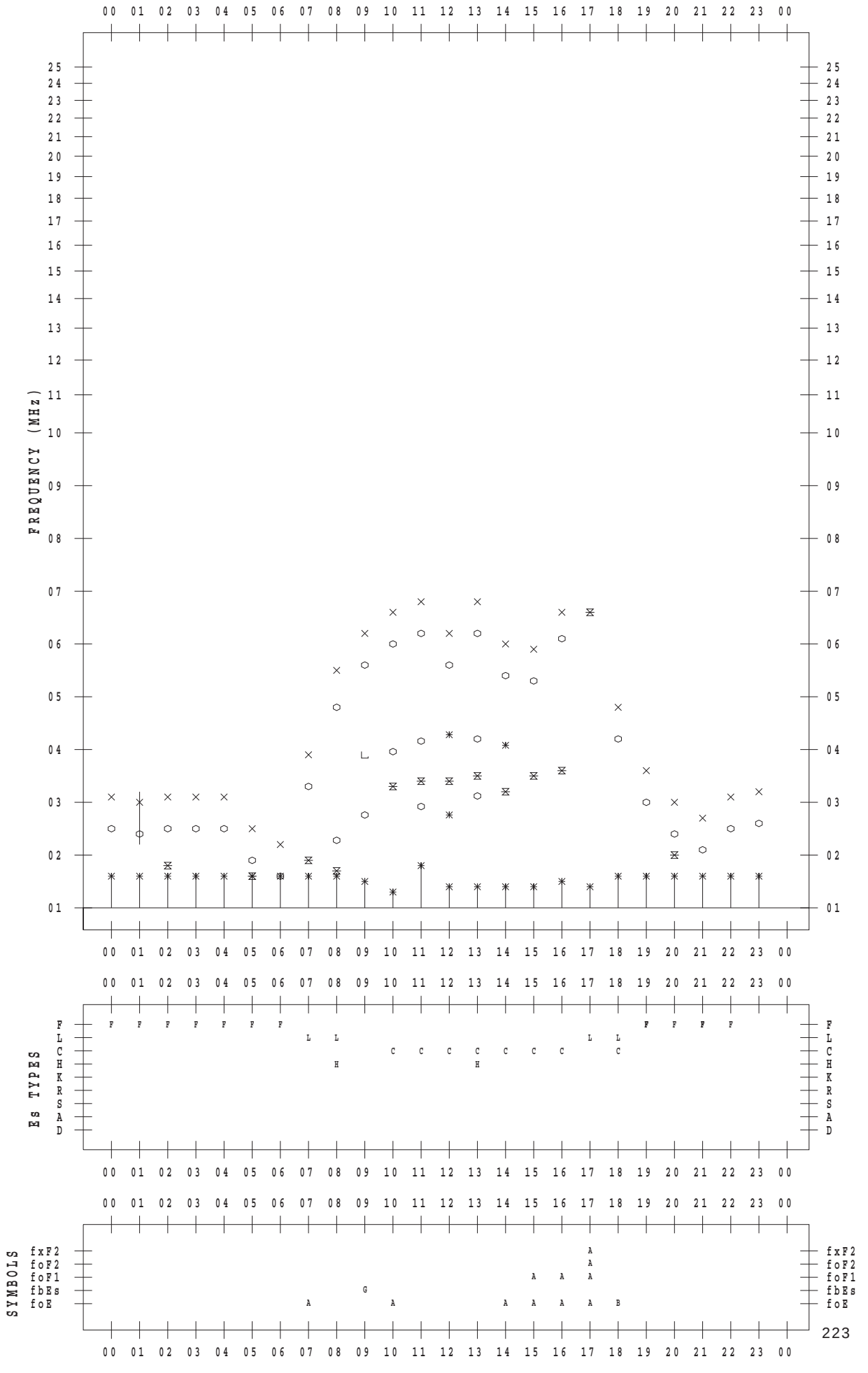
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018/11/26

135 °E MEAN TIME



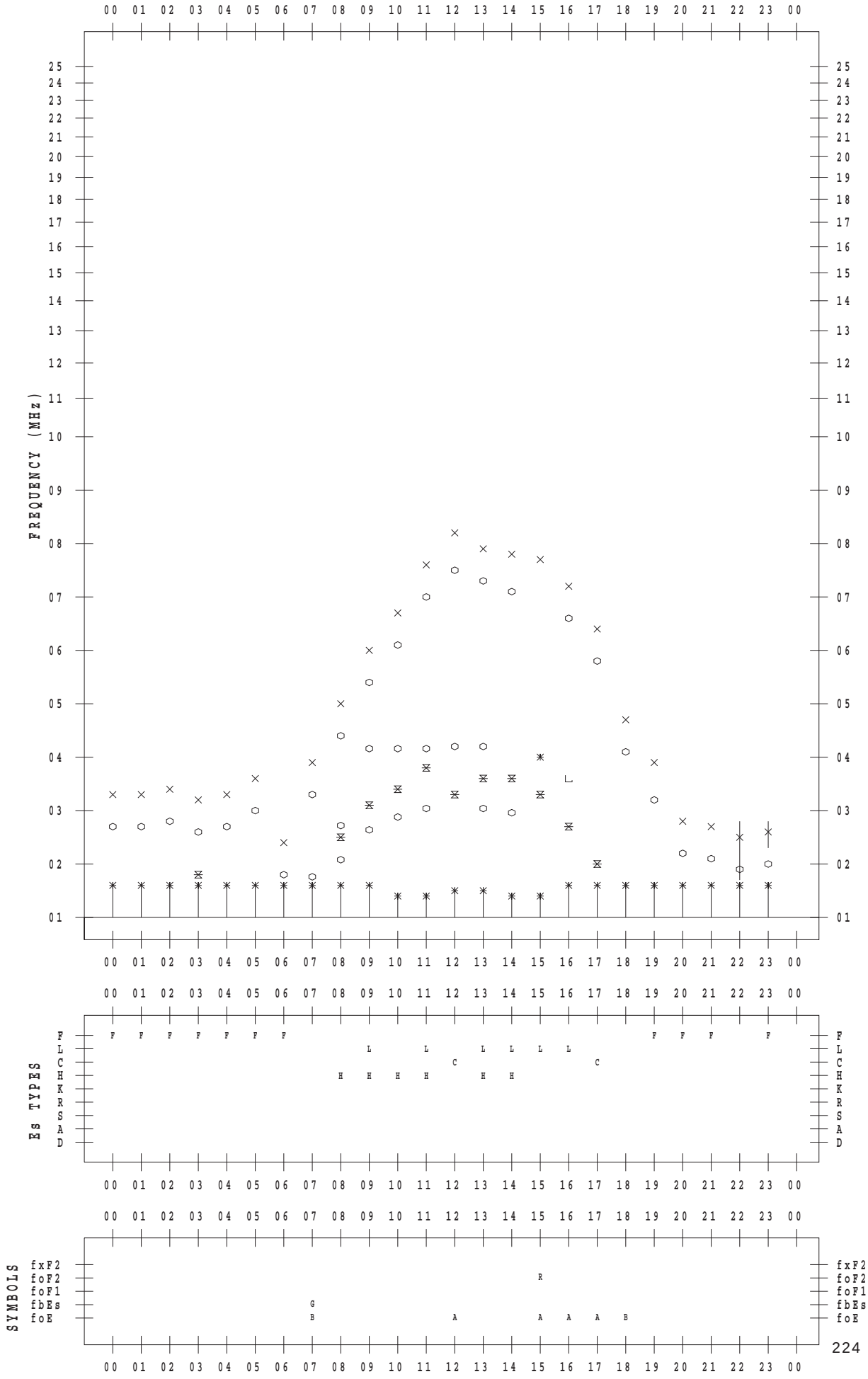
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018/11/27

135 °E MEAN TIME



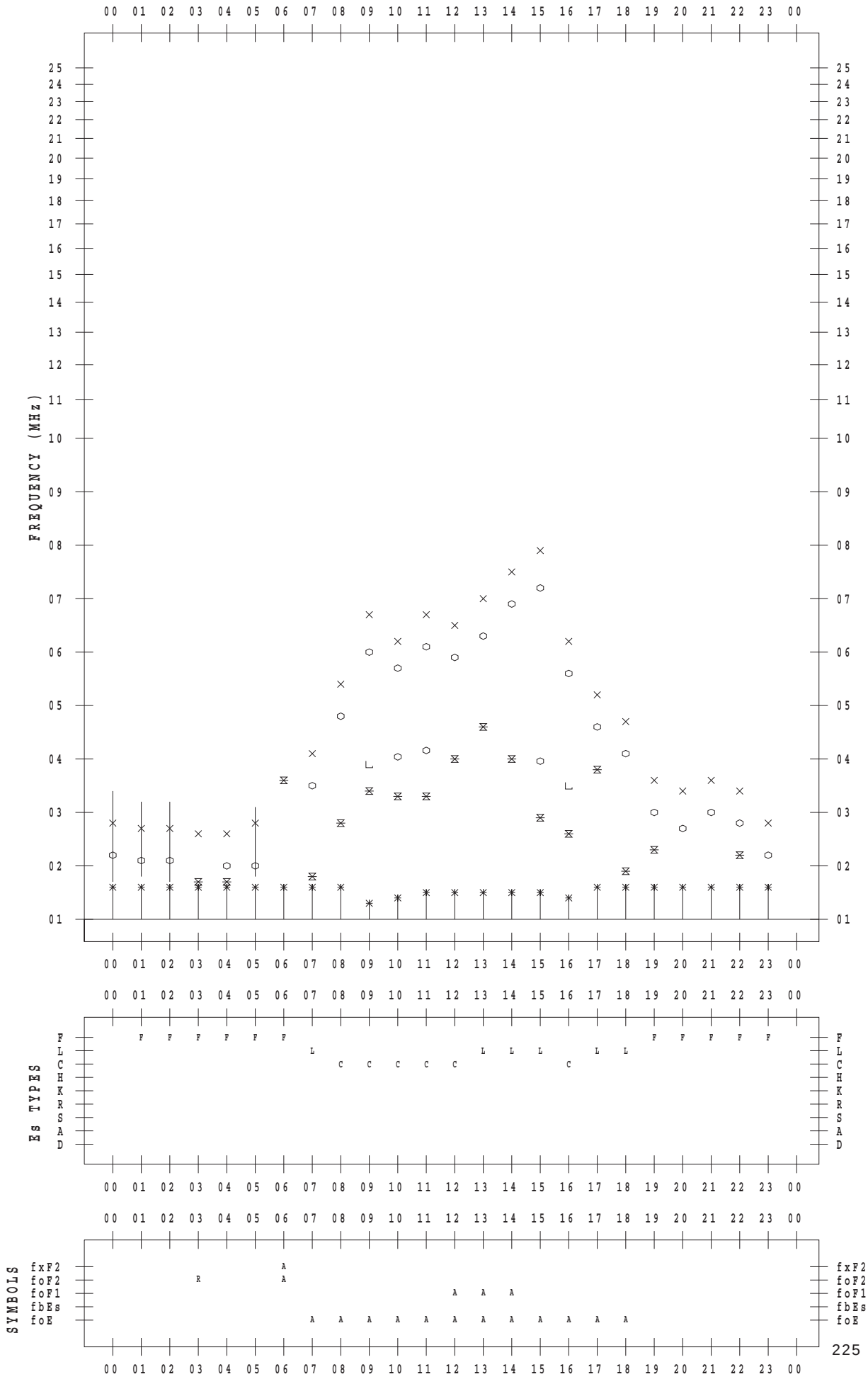
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018/11/28

135 °E MEAN TIME



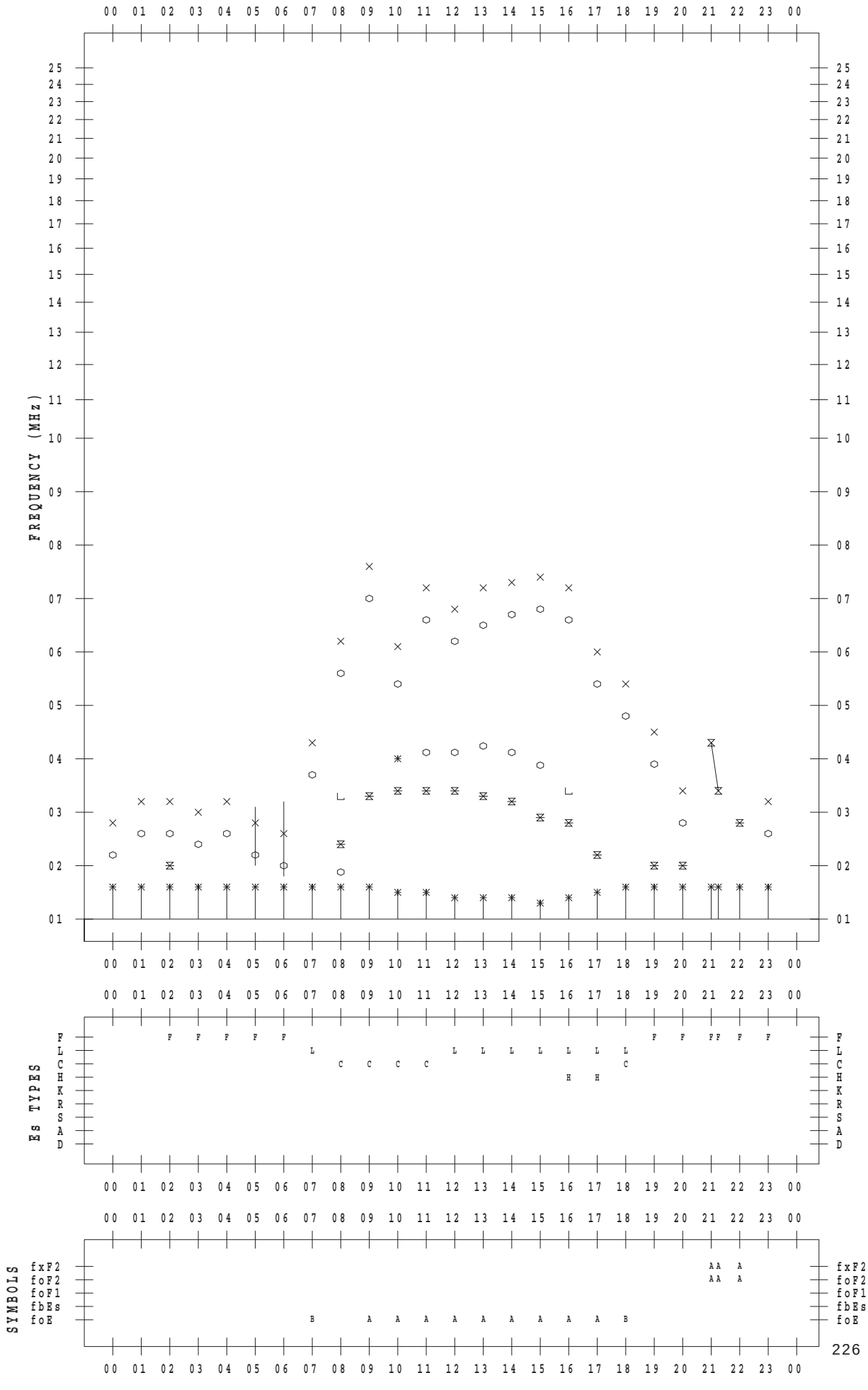
f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018/11/29

135 °E MEAN TIME



f-PLOT DATA

SCALER : I.YAMAZAKI

STATION : Okinawa

DATE : 2018/11/30

135 °E MEAN TIME